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Commodore MAGAZINE

RUN

April 1990
An IDG Communications Publication

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THE COMMODORE 64/128 USER'S GUIDE

CREATE MUSIC On Your Commodore

Consumer Electronics Show Report

Plus:

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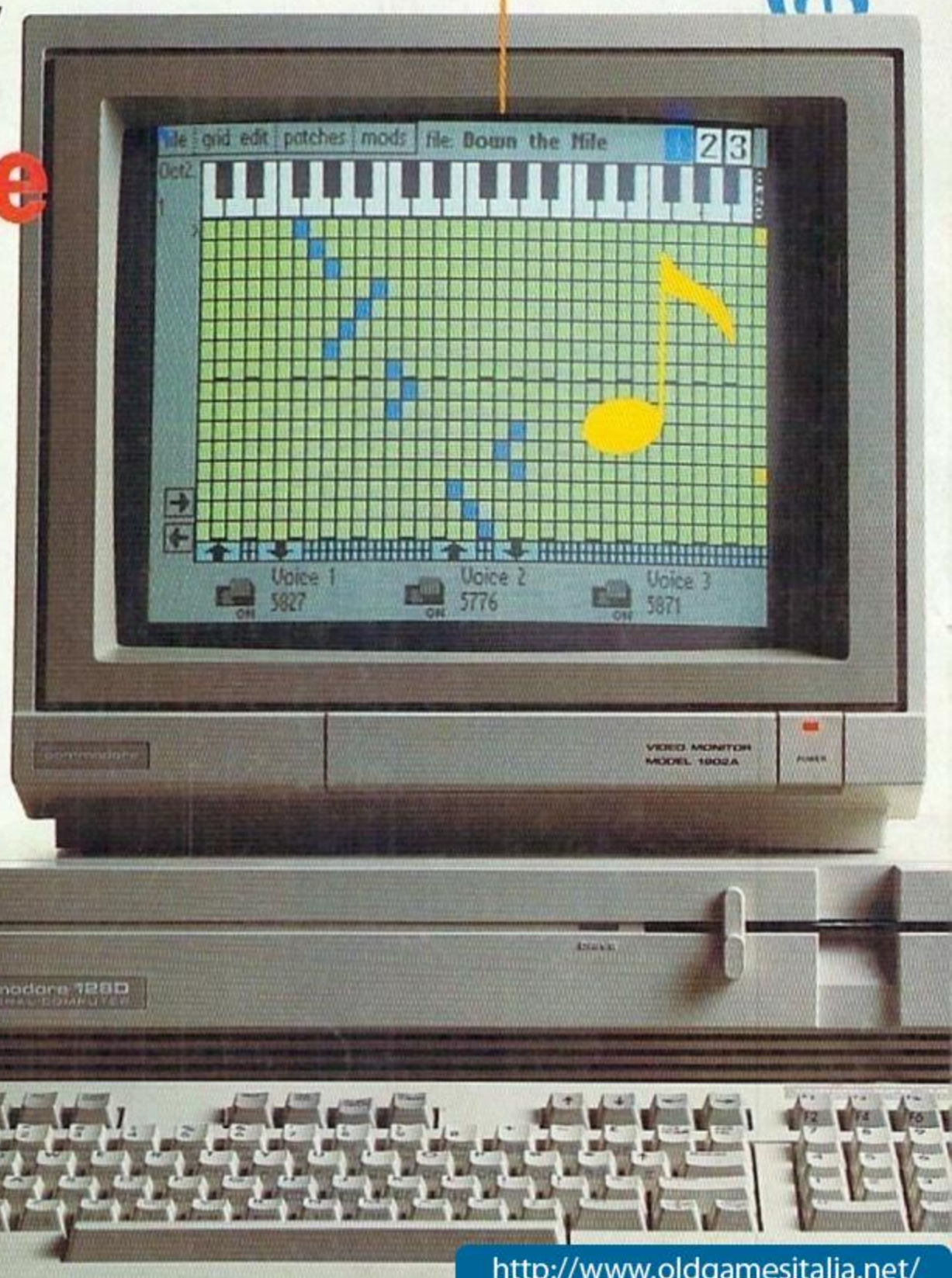
- Make a Date for Your Program
- Choose the Right GEOS Hardware
- And More!



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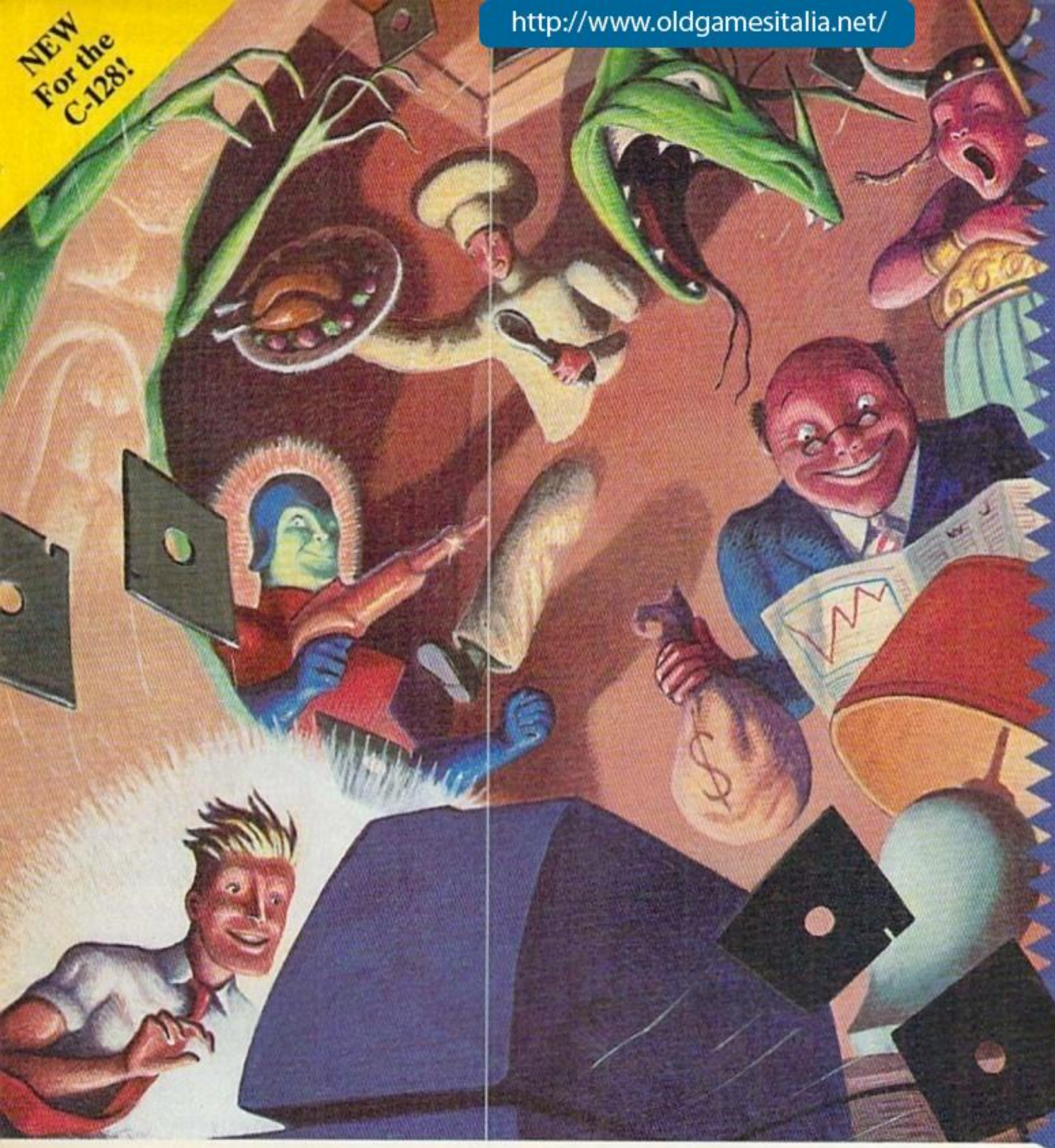

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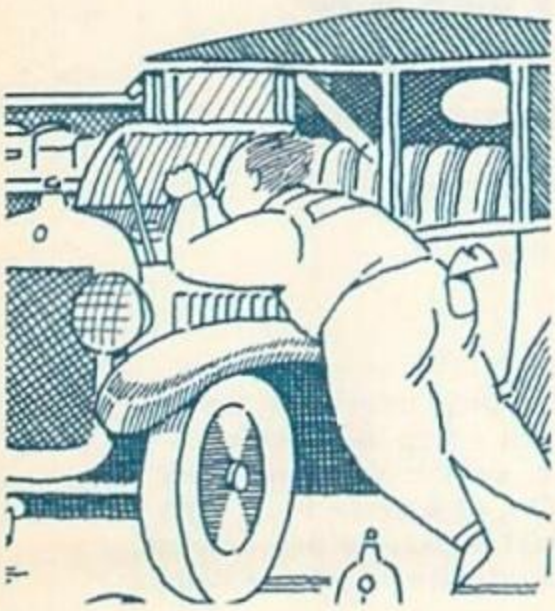
C O N T E N T S

VOLUME 7, NUMBER 4 APRIL 1990



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COVER PHOTOGRAPHED BY LARRY DUNN

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RUNning Ruminations

This year's Consumer Electronics Show in Las Vegas produced a pleasant surprise for Commodore owners.

CES THOUGHTS. . .I figured I would spend most of my time at the recent Consumer Electronics Show ogling the latest in electronic gadgetry—pocket-sized TVs, portable VCRs, electronic translators and thin-film technology TVs, such as the 14-inch job shown by Sharp. I reasoned that I could blanket the new developments in the Commodore computer market with a postage stamp.

The good news is I was wrong!

Not even the sticky-fingered San Francisco 49er secondary could cover this market, which continues to flourish as major software manufacturers release C-64 software. Over 50 new games are slated to appear this spring for the Commodore market.

At the annual electronic extravaganza in Las Vegas, most companies reaffirmed their commitment to continue to support the Commodore market, which, behind MS-DOS software, still represents the second best-selling format for software developers. So, in some cases, Commodore owners may have a wait, although it will be a brief one, for the hottest new game to be released in the C-64 format.

We also spotted another continuing trend in software development at the show. It appears that several companies, instead of tooling up to develop their own software, are looking elsewhere—particularly towards the U.K.—to purchase rights to market other software.

New software abounded: Sega showed Altered Beast, Mediagenic previewed Grave Yardage and Taito displayed Operation Thunderbolt. We took particular note of a new hardware device from a company called Camerica. They're producing a product that will allow CD players to run CD software on the C-64. Look for this product, together with at least one CD disc loaded with software, to be offered later this year.

HOLY DOUBLE TAKE, BATMAN!. . .It seems that some people can't get enough of Batman. So, Data East has released its second Batman program for the C-64. The latest one is entitled Batman: The Movie, while the first release is called Batman: The Caped Crusader. The later version appears much more challenging than the comic-book-like Caped Crusader version and is true to the experiences in the box office hit. . .including Batman's tools of the trade, the Batmobile, Batwing and Batarang.

Continued on page 64.

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NEW

8 Unbeatable Reasons Why C-128 Owners Everywhere Are Winners with

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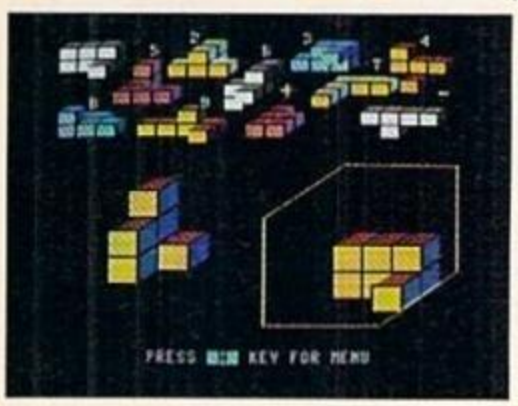
1. **BLOODSTAR***. It's a desperate international race, pitting you against Japan, the Soviet Union and the United European States as you each try to colonize the rest of the solar system. Enjoy hours and hours of realistic strategy gameplay. By itself, **BLOODSTAR** is worth the entire cost of **FUN PAK 128**!

2. **MAZAMORF***. If you liked Pac-Man, you'll be doubly challenged to avoid these voracious meanies. And all the while you'll be trying to make your way out of a maddeningly different kind of maze!

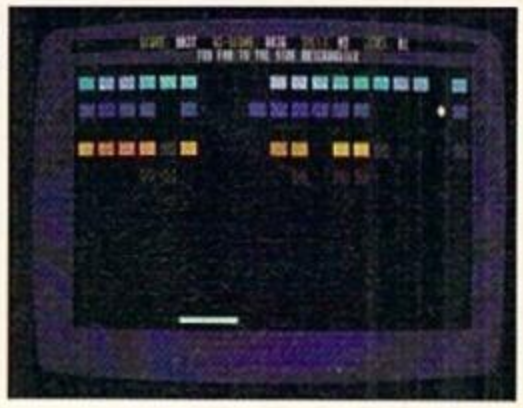
3 & 4. Think you qualify for MENSA membership? Then **CUBIX 2*** and **CUBIX 3*** are ready for the test!



But beware, these twin teasers share only their name—and their neural nastiness!

5. Meanwhile, back in the outer reaches of the universe, load up for a couple rounds of **DEATH QUADRANT**. The blast-happy lover of Asteroids in you will never be busier!

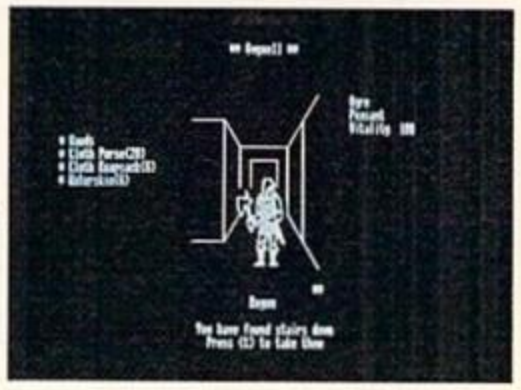
6. Remember what the good old days were like? Well, **BYE, BYE BRICK** reminds you of the by-gone thrills of Breakout, but this time in 80-column color mode.



7. Get your trigger-finger ready for **NIGHTHAWK 128**, a delightful challenge that tests your driving and your shooting skills!

8. **GWYNELL** is a detailed 3-D maze adventure that takes you through level-upon-level of dungeon-danger.

There's always an encounter or an interesting twist just beyond the next door!



* Denotes a 40-column mode game.

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MAGIC

Create wild and wonderful screen displays with four different screen and title routines, and selectively list C-64 directories by file types.

By TIM WALSH

$58C TITLE BOUNCER 64

Perk up your title screens with the title subroutine, Title Bouncer 64. Put your own title into T$ and run the program, then sit back and watch the title bounce up and down. The range of each bounce shrinks until it gets to the center of the screen, then starts over.

```
Ø REM BOUNCING TITLES 64 - JEFFREY PANICI
                                        :REM*93
1Ø POKE 53281,Ø:POKE 5328Ø,Ø:PRINTCHR$(147
   ):T$="*** YOUR TITLE HERE ***"  :REM*76
2Ø DEF FNT(X)=(4Ø-LEN(T$))/2        :REM*76
3Ø Y=23:X1=1:X2=23:POKE 214,Y:PRINT:PRINT
   TAB(FNT(.))T$                    :REM*92
4Ø FOR I=X2 TO X1 STEP-1:PRINTCHR$(147):PO
   KE 214,I:PRINT:PRINTTAB(FNT(.))T$
                                        :REM*184
5Ø FOR P=1 TO 2:NEXT:POKE 646,INT(RND(1)*(
   16-2)+2):NEXT:X2=X2-1            :REM*153
6Ø IF X2=12 THEN 2Ø                 :REM*2Ø1
7Ø FOR I=X1 TO X2:PRINTCHR$(147):POKE 214,
   I:PRINT:PRINTTAB(FNT(.))T$       :REM*17Ø
8Ø FOR P=1 TO 2:NEXT:POKE 646,INT(RND(1)*(
   16-2)+2):NEXT:X1=X1+1             :REM*47
9Ø GOTO 4Ø                          :REM*218
```

—JEFFREY D. PANICI, SANDWICH, IL

$58D BORDER LIGHTS 64/128

Border Lights 64/128 cycles multicolored lights along the 40-column screen border of your C-64 or C-128. When you append it to Sway 64/128, the following trick, it makes for a great screen display.

```
Ø REM BORDER LIGHTS 64/128 - TONY EBERLE
                                        :REM*71
1Ø POKE5328Ø,Ø:POKE53281,Ø:C=81:X=.:GOTO1Ø
   Ø                                    :REM*49
2Ø FORD=1Ø24TO1Ø63:POKED,C:NEXT:FORD=11Ø3T
   O2Ø24STEP4Ø:POKED,C:NEXT         :REM*144
3Ø FORD=2Ø24TO1984STEP-1:POKED,C:NEXT:FORD
   =1984TO1Ø24STEP-4Ø:POKED,C:NEXT  :REM*41
4Ø FORD=55296TO55335:POKED,X:NEXT:FORD=553
   75TO56295STEP4Ø:POKED,X:NEXT      :REM*1
5Ø FORD=56295TO56256STEP-1:POKED,X:NEXT:FO
   RD=56256TO55296STEP-4Ø:POKED,X:NEXT
                                        :REM*22
6Ø X=X+1:IFX>254THENX=1              :REM*5
7Ø GETA$:IF A$="" THEN RETURN       :REM*252
8Ø END                              :REM*2Ø8
9Ø RETURN                           :REM*232
1ØØ PRINTCHR$(147)                   :REM*51
11Ø PRINTTAB(1Ø)"{CRSR DN}64/128 BORDER LI
   GHTS":PRINTTAB(12)"{2 CRSR DNs}BY{2 SP
   ACEs}TONY EBERLE"                :REM*241
12Ø PRINT:PRINT:PRINT:PRINTTAB(1Ø)"PRESS A
    KEY TO QUIT.":GOSUB2Ø           :REM*31
13Ø GOSUB4Ø                          :REM*5
14Ø GOTO13Ø                         :REM*21Ø
```

—TONY EBERLE, SANDWICH, IL

$58E SWAY 64/128

Make the whole C-64 or C-128 40-column screen sway with Sway 64/128. Use it as a stand-alone program or as a subroutine in your own programs.

```
Ø REM SWAY 64/128 - TONY EBERLE     :REM*178
1Ø POKE 5328Ø,Ø: POKE 53281,Ø:PRINTCHR$(14
   7)                               :REM*252
2Ø PRINTTAB(5)"{2 CRSR DNs}{2 SPACEs}{SHFT
    U}{2 SHFT Cs}{5 SHFT *s}{12 SHFT Cs}{S
   HFT I}"                          :REM*37
3Ø PRINTTAB(6)" {SHFT B}{4 SPACEs}SWAY 64/
   128{4 SPACEs}{SHFT B}":PRINTTAB(5)"{2 S
   PACEs}{SHFT J}{5 SHFT *s}{14 SHFT Cs}{S
   HFT K}"                          :REM*163
4Ø PRINT"{2 CRSR DNs}WORKS IN C-128 4Ø-COL
   UMN MODE, TOO!"                  :REM*15Ø
5Ø PRINTTAB(11)"{2 CRSR DNs}BY TONY EBERLE
   "                                :REM*214
6Ø FORLR=ØTO7:POKE5327Ø,(PEEK(5327Ø)AND248
   )+LR:NEXTLR                      :REM*1Ø8
7Ø FORRL=7TOØSTEP-1:POKE5327Ø,(PEEK(5327Ø)
   AND248)+RL:NEXTRL:GOTO6Ø         :REM*184
```

—TONY EBERLE, SANDWICH, IL

$58F TEXT COLOR SCRAMBLER 64

Use Text Color Scrambler 64 to cycle the C-64's 16 colors through all the bytes on the screen. Turn on the effect by entering SYS 49152 and turn it off with SYS 49217.

The cycling runs fast enough to make reading screen text difficult, so it's best to use this routine with large letters and graphics. Appending this trick to Border Lights (trick $58D above) also gives you a super screen display.

```
Ø REM TEXT COLOR SCRAMBLER 64 - FREDRIC PU
  LLIAM                                 :REM*2
1Ø FOR T=49152 TO 49231:READ D:POKE T,D:NE
   XT                                   :REM*2Ø
2Ø DATA 169,255,141,14,212,141,15,212,169,
   128,141,18,212,12Ø,173,2Ø,3      :REM*161►
```


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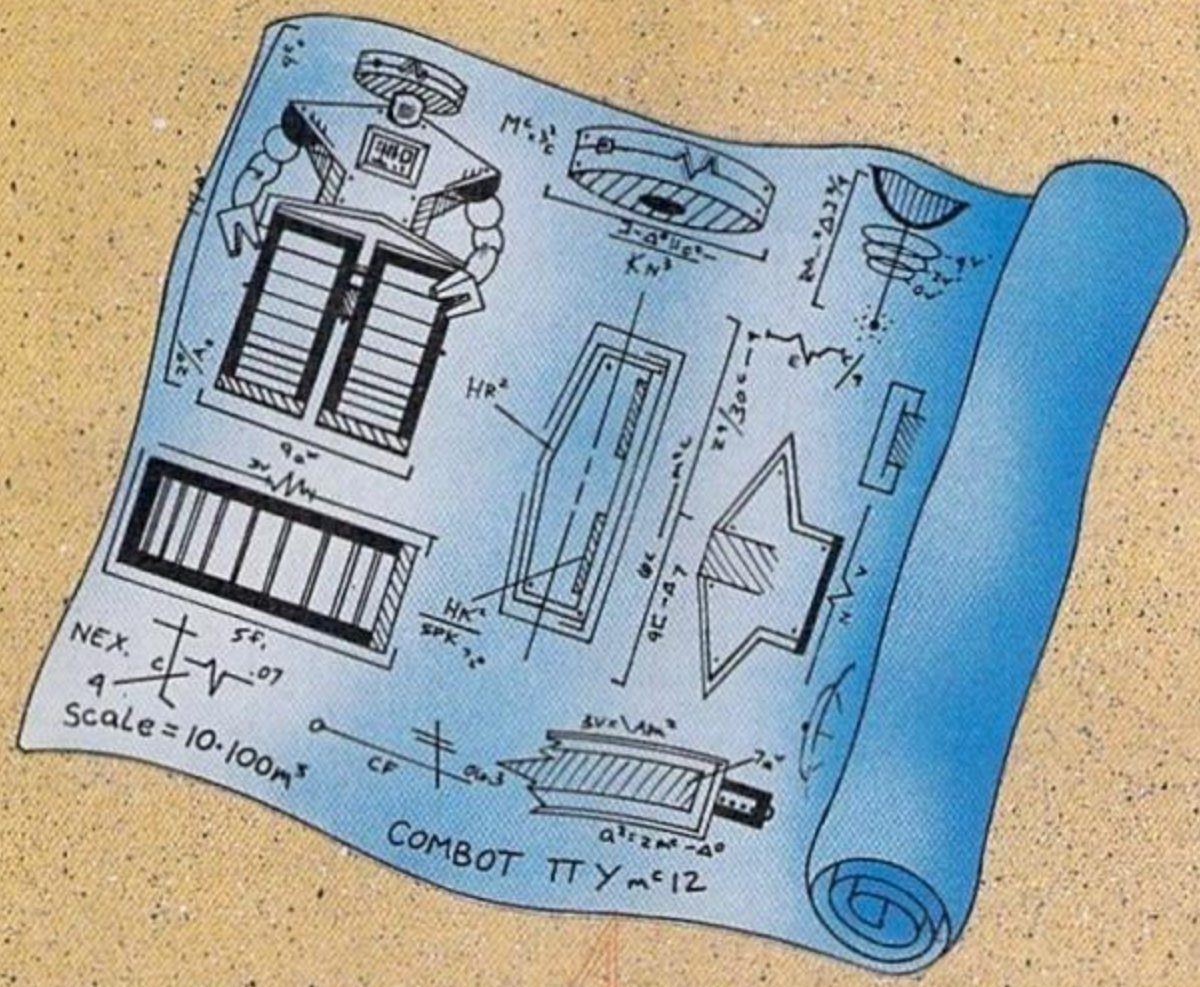
It's Going to Take Ingenuity and Know-How to Win This War



COMBOTS

Build the Ultimate War Machine

Formidable alien robots have been sent to conquer the earth. To win this war, you have to develop the creative talents and computer savvy to build the ultimate COMBOT war machine.

In the tradition of Japananimation, the computer game, COMBOTS, pits you against virtually indestructible alien warrior robots. You'll need finances and successful salvage missions to acquire the parts to start building your army of COMBOTS. Most importantly, you'll need battle experience.

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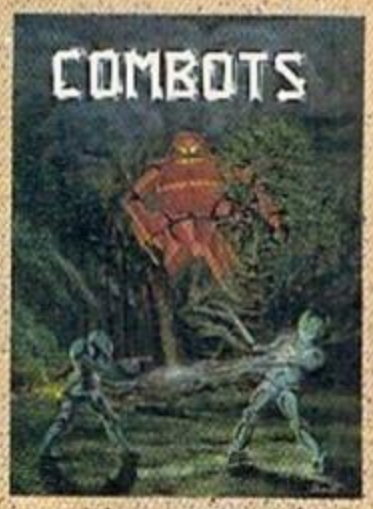

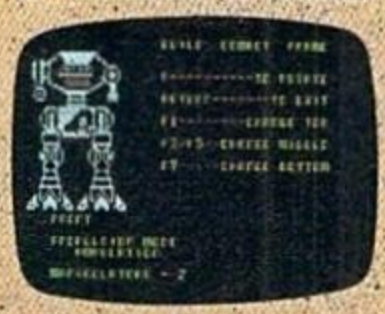

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```
3Ø DATA 141,38,192,173,21,3,141,39,192,169
   ,4Ø,141,2Ø,3,169,192,141,21,3  :REM*145
4Ø DATA 88,96,234,234,162,Ø,173,27,212,157
   ,Ø,216,157,Ø,217,157,Ø,218     :REM*16Ø
5Ø DATA 157,Ø,219,232,224,Ø,2Ø8,236,1Ø8,38
   ,192,12Ø,173,38,192,141,2Ø,3   :REM*239
6Ø DATA 173,39,192,141,21,3,88,96  :REM*2Ø
```

—FREDRIC PULLIAM, BUTTE, MT

$590 LINE FREEZE 64

Line Freeze 64 "freezes" the first six rows at the top of the C-64 screen so that text and data you need to refer to won't be accidentally erased.

To freeze up to six lines, multiply the number of lines you want to freeze by 40, then Poke that value into location 49182. For instance, to freeze six lines, run Line Freeze 64, then enter POKE 49182,240 followed by SYS 49152. "Thaw out" frozen screen lines with SYS 49220.

```
Ø REM SIX-LINE FREEZE 64 - FREDRIC PULLIAM
                                    :REM*65
1Ø FOR T=49152 TO 49235:READ D:CK=CK+D:POK
   E T,D:NEXT                       :REM*49
2Ø IF CK<> 9252 THEN PRINT "ERROR IN DATA.
   .":END                           :REM*197
3Ø DATA 76,31,192,12Ø,173,2Ø,3,141,28,192,
   173,21,3,141,29,192,169,48,141  :REM*8Ø
4Ø DATA 2Ø,3,169,192,141,21,3,88,96,234,23
   4,4Ø,16Ø,Ø,2Ø4,3Ø,192,24Ø,221   :REM*62
5Ø DATA 185,Ø,4,153,83,192,2ØØ,76,33,192,1
   6Ø,Ø,2Ø4,3Ø,192,24Ø,1Ø,185,83   :REM*11
6Ø DATA 192,153,Ø,4,2ØØ,76,5Ø,192,1Ø8,28,1
   92,12Ø,173,28,192,141,2Ø,3,173 :REM*227
7Ø DATA 29,192,141,21,3,88,96,234  :REM*96
```

—FREDRIC PULLIAM, BUTTE, MT

$591 FILE TYPE DIRECTORY 64

File Type Directory 64 lets you select directory listings based on file types. [C-128 users should see Mark Jordan's 128 Mode column elsewhere in this issue for a discussion of the 128's Directory command.—Eds.] After entering, saving, and running File Type Directory 64, enter SYS 49152,X, where X is one of the following letters: P (Program files); S (Sequential files); U (User files); R (Relative files); and A (All files).

Pressing the Commodore logo, shift or shift-lock key pauses the directory as it lists to the screen. Because this program works in Program as well as Direct mode, you can use it as a specialized subroutine in your own programs.

```
Ø REM FILE TYPE DIRECTORY 64{2 SPACEs}- MI
  CHAEL MYERS                       :REM*182
1Ø FOR T=49152 TO 49385:READ D:POKET,D:CK=
   CK+D:NEXT                        :REM*163
2Ø IF CK <> 3337Ø THEN PRINT"ERROR IN DATA
   ...":END                         :REM*234
3Ø Y=1:FOR I=1 TO 5:A$=MID$("PRGSEQRELUSRA
   LL",Y,3)                         :REM*73
4Ø PRINT"SYS 49152,"LEFT$(A$,1);": FOR ";A
   $;" FILES"                       :REM*45
5Ø Y=Y+3:NEXT:END                   :REM*2Ø2
6Ø DATA 32,115,Ø,133,251,141,224,192,32,11
   5,Ø,169,36,133,169,169,48,133   :REM*125
7Ø DATA 17Ø,169,2,162,169,16Ø,Ø,32,189,255
   ,169,8,162,8,16Ø,Ø,32,186,255   :REM*88
8Ø DATA 32,192,255,162,8,32,198,255,32,2Ø7
   ,255,32,2Ø7,255,169,18,32,21Ø   :REM*55
9Ø DATA 255,169,255,133,252,133,253,16Ø,Ø,
   32,2Ø7,255,72,32,183,255,2Ø1    :REM*128
1ØØ DATA 64,24Ø,1Ø9,1Ø4,153,234,192,2ØØ,19
   2,32,2Ø8,236,23Ø,252,24Ø,31     :REM*195
11Ø DATA 165,251,2Ø1,65,24Ø,14,16Ø,22,2ØØ,
   185,234,192,2Ø1,32,24Ø,248,197 :REM*57
12Ø DATA 251,2Ø8,21Ø,174,234,192,173,235,1
   92,32,2Ø5,189,56,32,24Ø,255,24:REM*169
13Ø DATA 16Ø,4,32,24Ø,255,23Ø,253,16Ø,Ø,16
   2,4,189,234,192,2Ø1,34,24Ø,3   :REM*228
14Ø DATA 232,2Ø8,246,32,21Ø,255,232,189,23
   4,192,2ØØ,192,19,2Ø8,244,173,1:REM*223
15Ø DATA 193,2Ø1,32,24Ø,3,32,63,171,169,1,
   16Ø,193,32,3Ø,171,169,13,32     :REM*172
16Ø DATA 21Ø,255,173,141,2,2Ø8,251,24Ø,134
   ,1Ø4,169,8,32,195,255,32,2Ø4    :REM*45
17Ø DATA 255,174,234,192,173,235,192,32,2Ø
   5,189,169,217,16Ø,192,32,3Ø     :REM*147
18Ø DATA 171,166,253,169,Ø,32,2Ø5,189,96,3
   2,7Ø,82,69,69,46,32,8Ø,45,7Ø     :REM*6
19Ø DATA 73,76,69,83,58,32,Ø        :REM*228
```

—MICHAEL MYERS, BEARDSTOWN, IL

$592 MATH QUIZ 64/128

Sharpening multiplication skills needn't be boring for a child. Math Quiz 64/128 makes the drill fun. Type in and save the program, then run it in 64 or 128 mode (40 or 80 columns). Random multiplication problems appear, and the child must enter the correct answer to move on to the next problem, and he or she can quit the program after giving a correct answer.

```
Ø REM 64/128 MATH QUIZ - STEVE KOOPS
                                    :REM*61
5 CLR:A$=CHR$(32):B$="*":C$="="    :REM*226
1Ø A=INT(RND(Ø)*99)+1:A=INT(A/1Ø)   :REM*73
2Ø B=INT(RND(Ø)*99)+1:B=INT(B/1Ø)   :REM*56
3Ø PRINTA$;A;B$;B;C$                :REM*9Ø
4Ø INPUT"ENTER THE ANSWER";D        :REM*156
5Ø C=A*B                            :REM*144
6Ø IF D=CTHEN 8Ø                     :REM*94
7Ø PRINT"WRONG":GOTO3Ø              :REM*176
8Ø PRINT"CORRECT!{2 SPACEs}DO YOU WANT ANO
   THER?"                           :REM*171
9Ø GETA$:IFA$="" THEN 9Ø            :REM*117
1ØØ IF A$="Y"GOTO 5                 :REM*118
```

—STEVE KOOPS, ROYAL OAK, MI ■

Magic is a forum for RUN*'s imaginative and inventive readers to share their programming tips, brief software or hardware modifications, shortcuts or items of general interest. If you have an idea to make computing easier, faster, more exciting and enjoyable, send it to: Magic, RUN Magazine, 80 Elm St., Peterborough, NH 03458.*

RUN *pays $10 to $40 for each trick published in the column. If you'd like a copy of the latest edition of* RUN*'s Magic Trick Writer's Guide, send your request with a self-addressed, stamped, business-size envelope; you'll receive a copy in two or three weeks.*

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NEWS AND NEW PRODUCTS

Find out what new goodies software developers offered at the Consumer Electronics Show in Las Vegas last January.

Compiled by HAROLD R. BJORNSEN

AMUSEMENT PARK

MENLO PARK, CA—Mediagenic (3885 Bohannon Drive, Menlo Park, CA 94025) is distributing several new titles for the C-64.

In **Ghostbusters II**, players must bust out of Parkview asylum, collect slime in the sewers and protect a judge from the haunting Scoleri brothers, as well as steer the Statue of Liberty through Manhattan's streets and battle Vigo the Carpathian for the soul of New York. $29.95.

The journey in **Beyond Dark Castle** begins as Prince Duncan returns once again to enter a castle in a quest to defeat the evil Black Knight. Scattered throughout the castle are five magic orbs that must be found and returned to the castle's Ante Room before confronting the evil foe in a showdown. Available for $29.95.

Players can use claws, knives, clubs and energy blasts in **Grave Yardage** to tackle goblins, ogres, zombies, ghouls and other creatures. It's up to you to choose monsters in a lineup, replace the dead and dying with the fresh and furious and design the plays, playing field and team. $24.95.

In **Face Off**, players battle their way through the NHL team to the goalie. Determine your lineup with first-stringers and bench warmers. Players' efforts will determine if the team will play for the Stanley Cup. $29.95.

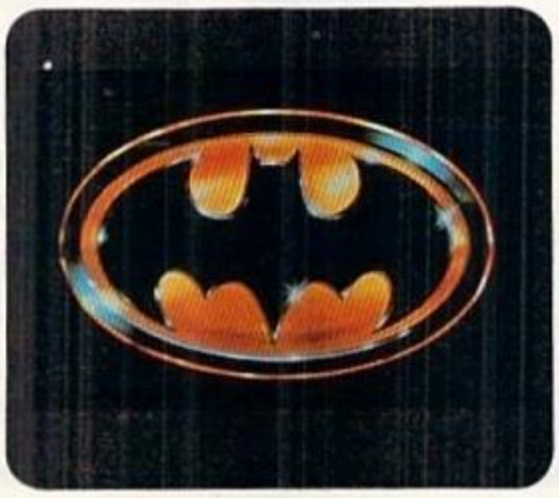
Power Drift has the players race on five different rollercoaster tracks and courses, each of increasing difficulty. Races are four laps of high-speed turns, collisions and wipeouts against a group of opponents. $39.95.

Check Reader Service number 400.

CRIME, INC.

SAN JOSE—Data East (1850 Little Orchard St., San Jose, CA 95125) introduces two software packages for the C-64 based on recent films.

Batman: The Movie features the Batmobile, the Batwing and the Batarang to help you save Gotham City from the Joker. The program follows the movie's storyline and includes the film's sound effects. $29.95.



The bat symbol alone is enough to strike fear and loathing into the hearts of criminals bent on doing dastardly deeds in Batman: The Movie!

In **The Untouchables**, an action game, players get the chance to be all-American heroes and fight the strongest, dirtiest crime force in history, using different types of ammunition and capturing guns from the enemy for greater firepower. Elliot Ness even does body rolls and anything else it takes to beat the mob and bring Al Capone to justice. $29.95.

Check Reader Service number 402.

BATTLES OF VARIOUS KINDS

SAN MATEO, CA—Electronic Arts (1820 Gateway Drive, San Mateo, CA 94404) is distributing several new games for the C-64.

Pro Tennis Tour—The Ultimate Tennis Simulation features the four major world tournaments. But before stepping into center court, you can practice your serve or strokes against the computer or another player. The six practice programs feature three levels of difficulty on grass, clay or cement courts. $29.95.

Enter a medieval world and encounter its legendary characters. Prove your birthright through using strategy and strength; amaze the town with your superior archery, arm wrestling, sword-play, and dice-throwing skills; travel the towns in search of those who can answer your questions; and build a following that not only respects you, but will go to war for you. Take charge. Prove you are **Iron Lord—The Crusader of Justice**. $39.95.

Summoned by Zeus, God of Thunder, you have been awakened from the dead to challenge the wicked Neff, God of the Underworld, for the fate of Athena. You are the **Altered Beast**, bestowed with five formidable forces of transformation, each more ferocious, more overwhelming than the last. You'll have to destroy Grave Masters, Chicken Stingers, Cave Needles and other foes. $34.95.

In **Pipe Dream**, a "desktop entertainment," the objective is to build the longest possible continuous pipeline, racing against a stream of chemical fluid called flooz. There are 36 increasingly difficult levels, ranging from the unencumbered basic playing field with seven pipe shapes to the higher levels with one-way pipes, obstacles and faster-flowing flooz. $29.95.

Check Reader Service number 403.

SOMETHING FOR TOTS

NORTH MIAMI BEACH—GameTek (2999 NE 191st St., Suite 800, North Miami Beach, FL 33180) is offering six Fisher-Price games, at $14.95 each, for C-64 users aged three to eight.

My Grand Piano is a music program that teaches basic piano theory and musical notation while entertaining children with 30 classic songs.

In **Bowling Alley**, kids learn basic math, coordination and spatial relationships from a bowling game with curved balls, computer scoring and sound effects.

School Bus Driver is a role-playing game of navigation and memory that lets kids pick up Fisher-Price Little People at bus stops and drive them to school. Includes time limits and surprise road blocks.

I Can Remember, a memory game, helps kids develop skills in number rec- ►

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Let's Make Calendars & Stationery by Melody Hall *List $10.95*	$6.95
Omni-Play Basketball *List $34.95* by Broderbund Was $24.95	$22.95
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ognition and visual recall. Includes three skill levels.

Firehouse Rescue teaches coordination and decision making while letting children drive their own fire truck to rescue Little People and their computer-animated cat.

Perfect Fit is a match-and-fit computer game that helps kids develop skills in picture and shape recognition with puzzles involving 60 different Fisher-Price toys. Includes three levels of difficulty.

Check Reader Service number 401.

SPORTS, STRATEGY, MILITARY, HORROR

BUFFALO GROVE, IL—Konami (900 Deerfield Parkway, Buffalo Grove, IL 60089) has released five new games for the C-64 at $29.95 each.

The horror-adventure game, **Castlevania**, takes players armed with a silvery stake through cavernous dungeons in search of Count Dracula.

In **Double Dribble**, a basketball game, players can test their defense, free throws and full-court press against a friend, or go one-on-one with the computer.

Blades of Steel has you facing off with a friend or the computer in a fight for the Stanley Cup.

The strategy game **Metal Gear** pits players against the evil dictator, Vermon CaTaffy, and his super weapon, which must be destroyed before the Colonel uses it to unleash violence across the globe.

Super C is a military-action game that takes players equipped with hi-tech lasers and rapid-fire machine guns past tropical rain forests and alien cannons to save themselves and Earth. For one or two players.

Check Reader Service number 404.

FOR RACING FANS ONLY

SAN JOSE—Accolade (550 South Winchester Blvd., Suite 200, San Jose, CA 95128) has released several new titles for the C-64. Prices for most were unavailable at press time.

The Muscle Cars is a car-accessory disk for use with the company's Test Drive II racing car game. It lets you choose from five muscle cars of the '60s: the '63 Corvette Sting Ray; the '68 Shelby GT 500 Cobra; the '67 Pontiac GTO; the '69 COPO, 9560 ZL-1 Camaro; and the '69 Dodge Charger Daytona.

European Challenge is a scenery disk for use with Test Drive II. With it, you can race across some of the major highways of Europe.

Heat Wave: Offshore Superboat Racing simulates an entire season of powerboat racing against ten computer opponents. The program features varying weather and water conditions, four different boat designs and the ability to analyze your competitors' crafts, skills and racing records.

Strike Aces: International Bombing Competition combines combat, strategy and strike missions with replicas of 13 different aircraft. The flight simulation takes pilots on 16 different combat-intensive missions over the skies or lets them take charge and design their own missions. $39.95.

Check Reader Service number 406. ■

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Super Graphix – an enhanced printer interface which has NLQ built in and includes an 8K buffer, 2 downloadable fonts, reset button, and a utility disk with 27 fonts.

Super Graphix jr – an economical printer interface with NLQ built in and includes 10 printing modes, graphics, and easy operation.

FontMaster II – a powerful word processor for the C-64 with 30 fonts ready to use, 65 commands, font creator, data merging, super- and subscripting, italicizing and more.

FontMaster 128 – a super word processor for the 128 with 56 fonts ready to use including foreign language fonts, on-screen font preview, 4 column printing, a 102,000-word spell checker and much more.

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MAIL RUN

RUN *empties its 1989 mailbox to clear the decks for the new decade.*

DELIVERING THE REST OF THE MAIL

Our files are overflowing. To make room for the 1990 entries, it's time to clean out the Mail RUN mailbox of all the 1989 letters that remain. Each of these had something important to say, but they didn't make it into the Mail RUN column because of space limitations or because they repeated statements in other letters. Herewith are excerpts from those letters that reflect some of the opinions and feelings of Commodore computer users in 1989.

"My loyalty to Commodore products is mainly due to the excellent service I receive from my local computer dealer."

"If Commodore could promote a 'Commodore Personal Computer Series,' with C-64s as introductory-level machines, Amigas as advanced-level computers and PC-compatibles as high-end business computers, they could get the idea across that they are supportive of all these machines and let customers grow and expand within the Commodore computing family alone."

"*RUN* should really try to publish more C-128, 80-column programs. . ."

"Thank you for the article, 'Troubleshooting Troublesome Type-ins' in the May issue. That article saved my day and my sanity."

"Commodore apparently goes out of its way to avoid making service or technical information available."

"Because of all the debate about what the plural form of a mouse is, I have found a suitable name: 'MIDs' (Mouse Input Devices)."

"I will continue to use my trusty C-128 until it up and dies."

"My C-64 is not as inflexible as most PC clones."

". . .the 1581 is a fine disk drive that needs more software support. . ."

"Applications software is plentiful and inexpensive."

"I did not start writing on my C-64 until I was 78 years old, and I find it keeps my mind active and gives me many hours of pleasant activity."

"If all the users of C-64s and C-128s would buy shares of Commodore stock, I think Commodore would listen to their complaints."

—*RUN* READERS

SEARCHING FOR HIS ROOTS

I'm looking for the Latter Day Saints program, Personal Ancestor File, for the C-128. I contacted the LDS Archives, but they've discontinued the program for Commodore computers. Can you or any of your readers help me?

—FRANCIS BLAHNIK
1116 FLAMBEAU ST.
MANITOWOC, WI 54220

We're publishing your letter in the hope that one of our readers will contact you with the program you need. Also, user groups and their newsletters are other possible sources. If all else fails, check with computer dealers and mail order firms for other C-128 genealogy programs.

—EDITORS

PICK A POCKET 2

Mark Jordan, the author of *RUN*'s new column, 128 Mode, is certainly correct when he notes that there is very little software that takes advantage of Commodore's 1351 mouse (see the January 1990 column). One major trio—and possibly the best package available for the C-128—was not named. The Pocket 2 programs—Writer, Filer and Planner—allow for mouse cursoring, range highlighting and pull-down menus.

—HOWARD L. HERMAN
NEW YORK, NY

The column was not an attempt to be comprehensive. The December 1989 issue of RUN *(see "Packing a Punch") presents a more detailed picture and calls the Pocket 2 series ". . .one of the best examples of device support for the C-128."*

—EDITORS

A BETTER WAY

In the January 1990 Commodore Clinic, columnist Ellen Rule states that to use the Sears SR-2000 printer with a Commodore computer, you must connect them with a parallel interface. This is not necessary.

The SR-2000 can be used in Epson mode or Commodore mode while it's hooked up to the serial port. Set DIP switch #6 to *off* for Epson or *on* for Commodore mode. Set DIP switch #8 *on* for Serial mode or *off* for Parallel mode. You may also set all the DIP switches to *off* except for #8, which should be set to the *on* position for Serial mode. The printer can then be used in Epson mode connected only by a serial cable.

—WILLIAM T. HARDEN
FERNANDINA BEACH, FL

Thanks for the correction. We appreciate all such helpful contributions.

—EDITORS

MAKING AN IMPRESSION

I was in need of a new printer and inundated with advertising brochures, all claiming to be the "best." Then, at the most opportune time, came the November 1989 issue of *RUN*. I thought, if anybody should know about printers, it would be *RUN*'s technical manager, Tim Walsh. So I read his article, "Making an Impression with Printers," and bought a Panasonic KX-P1191. I have it coupled to my C-128D with a Xetex Super Graphics Gold interface, and I couldn't ask for any better combination. I'm tickled pink and wish to thank *RUN* and Tim Walsh for saving my day.

—E. R. MOORE
TURLOCK, CA

We're glad we've made such a good impression. Thanks.

—EDITORS ■

A CALL TO READERS

Send your letters to Mail RUN, 80 Elm St., Peterborough, NH 03458. Each letter must include the writer's name and complete address. RUN *reserves the right to edit letters for style, clarity and space.*

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SOFTWARE GALLERY

Assume the personas of an intergalactic warrior, a conquering commander, the Man of Steel, James Bond and a bloke down under!

By BETH S. JALA

AUSSIE GAMES ..... A–

Take Off to 'Stralia
For Some Down-Under
Fun in the Sun!

Well, blokes, since this review is about some Aborigine games from down under, you're prob'ly expectin' it will be written using some not-so-imaginative Aussie colloquialisms.

Mates, I didn't want to disappoint you (or you sheilas, either). But so much for the "throw a little shrimp on the barbie" chatter. Let's do this review in plain English, even if this game is a "bloody beaut of a ripper" (as Crocodile Dundee might say).

Or, as an American reviewer would say: Aussie Games is a nicely done collection of half a dozen oddball contests.

How odd are they? Take the Belly Whack event for starters. Use the joystick to fill the pot-bellied diver with big breaths before the time bar moves to zero. When he jumps, line up the diver so he's parallel to the water for maximum belly whack. Animal judges on the sidelines will turn up numbered cards to show your diver's score.

The Beach Footy Ball players compete to see who can kick the ball the farthest down the beach. In the Boomerang Competition, you see some nice 3-D effects as you try to fling the boomerang from the plateau, watch it sail across the bush lowlands and grab it as it flies back.

In the Dry River Race, you hustle down a dry river bed carrying a boat over your head, trying to beat the other team to the finish line. Be careful not to trip over the little animals and other obstacles.

The Beer Shoot is another competition: From the back end of a rolling jeep, you try to shoot empty bottles the driver and passenger are tossing out. The road twists and turns, so holding the bottles in your sight becomes difficult. Since Aussie Games is marketed toward young audiences, this segment seems to send the wrong message. Not only is the driver drinking, but both driver and marksman are littering the electronic countryside. Mindscape partially acknowledges that in its documentation: "And do remember, while we think shooting beer bottles out here is okay, drinking and driving do not mix." So littering the landscape with broken glass is acceptable behavior?

You can belly whack, boomerang, bottle shoot or boat race in Aussie Games.

To close out a day of competitive Aussie fun, you go fishing for marlin. Your point score for the trip depends on how well you play the jumping fish, and the strength of the line you're using.

Depending on the event, players can compete against each other, for an event's high score or as team members.

Overall, Aussie Games offers some unusual variations on the Olympic game theme package. *(Mindscape, 3444 Dundee Rd., Northbrook, IL 60062. C-64/$29.95.)*

—LONNIE BROWN
LAKELAND, FL

REPORT CARD

A Superb!
An exceptional program that outshines all others.

B Good.
One of the better programs available in its category. A worthy addition to your software library.

C Average.
Lives up to its billing. No major hassles or disappointments here.

D Poor.
This program has some problems. There are better on the market.

E Failure.
Many problems; should be deep-sixed!

EMPIRE ..... B+

Wanted: Generals With
Logistics, Planning, Production
And Management Skills

The fans of war games, that special breed of software many of us love to hate, include both those who particularly love the games for their depth, strategy, charts, indexes and rules, and those who are impatient with them for the same reasons. Empire is one of the rare war simulations that can satisfy both groups by providing strategic challenge without the usual inherent frustrations.

As Captain William Brown of the United Galactic Alliance, you must find a way to stop the Krellean Empire from invading Alliance territory and gaining control of key resources. You find yourself dumped on an unexplored planet that you must reconnoiter and conquer.

The crux of Empire revolves around the "turn." Each turn consists of a production phase, followed by a movement and combat phase. It may take many turns before you eventually discover where your opponent is, so a lot of your time at the outset is spent exploring and settling the planet.

Only by building cities can you hope to expand your production base enough to build armies, fighters, transports, aircraft carriers and other warships. Because a unit can take from one ►

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to 50 turns to create, planning and resource conservation become key aspects. Sooner or later, you'll find your quarry—and you'd better be ready to fight!

The world is displayed on a gridded map that can be scrolled in four directions. Combat occurs when two opposing units attempt to move into the same square. Damage points are then subtracted until one unit emerges victorious. Since capturing all your opponent's cities is the main goal, only by having the right mix of units ready for battle can you gain an appreciable measure of success.

Unlike most war games, Empire's

Constructing cities will give you a base from which to build armies in Empire.

player interface is not only simple to learn but highly convenient, for most game controls consist of pull-down menus, file requestors and dialog boxes. Selection is accomplished using the keyboard, joystick or a mouse. While I certainly applaud the developers' efforts to emulate the type of interfaces found on Amigas and Macintoshes, I found the joystick control to be rather awkward and imprecise. Moreover, after you've become familiar with the program's mechanics, it actually slows game play.

Because of the easy-to-use menu structure and simplistic rules of engagement, Empire is a perfect choice for novice gamers. The documentation is thorough and easy to read. Empire is the first war game I've played where you can actually "boot and go" after only a cursory glance at the documentation. But don't let this simplicity fool you. Behind this friendly face is a superb and engaging exercise in strategy that will have you up for many, many nights to come. *(Interstel Corp.; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$39.95.)*

—JOHN RYAN
BILOXI, MS

SPACE ROGUE ..... B–

A Career in Space Is Yours in This Intergalactic Simulation!

You'd always dreamed of following your father to the stars, and finally, your dream came true. As a merchant marine, you spent the last year touring the universe and polishing your skills as a pilot. Then, you were assigned to investigate the Princess Blue. But before you could, you watched helplessly as the Manchi ships blew the Princess Blue and your former shipmates into space dust.

For some reason, instead of destroying you as well, the Manchi ships returned to N-Space. You've decided to outfit a ship, become an independent trader and search the universe until you find the Manchi and get revenge for their murderous attack on the Princess Blue.

In each world you visit, you find an arcade game designed to hone your combat skills. If you progress through four levels, you win a prize. While exploring the galaxy, you also meet some people who help you and some who are of no help—others are downright nasty! In addition, you engage in trading and bounty hunting.

Although advertised as a role-playing adventure, the only role-playing attribute I could find in Space Rogue was "repute"—any reputation you may have gained as a combat pilot. With each victory, your repute increases, and you're given more dangerous (and prestigious) assignments.

I found this game too dependent on joystick manipulation to truly be called a "role-playing game." The graphics are average, but the game can be quite enjoyable if you're prepared for an afternoon of what I consider to be arcade-game play. I think most true RPG fans will be disappointed unless they're also

On a routine trading mission in the backwater Karonus system, your merchant ship, the PRINCESS BLUE, picks up a Small Craft Distress Beacon.
"No life readings," says Captain Dalfrae. "Looks like a derelict. You're on EVA duty, Private: go scope it out. Make it quick! We're behind schedule.

An attack on the Princess Blue spurs you to scour the galaxies in Space Rogue.

arcade addicts. *(Origin Systems, Inc., PO Box 161750, Austin, TX 78716. C-64/$49.95.)*

—ART LEWIS KIMBALL
TUSCOLA, IL

LIFE FORCE ..... B–

Warning: Beware of Hungry Space Creature!

The object of Life Force is to destroy Zelos, a huge space monster who eats solar systems for breakfast. To accomplish this, you have to pilot your armed starship, the Vic Viper, through six

Be sure you don't let Zelos snack on any celestial bodies in Life Force.

"terror zones" that are parts of Zelos. Each of these zones is guarded by hundreds of alien attackers and one enemy mayor. You find that the mayors are not smiling politicians handing out keys to the city, but rather bizarre monsters that resemble a brain, a dragon, a skull, a robot and even King Tut. If you make it to the end of the sixth zone, you have a chance to attack the heart and soul of Zelos.

As you play Life Force, your starship moves through the vertically or horizontally scrolling zones at a constant speed while you control the ship's screen position. Although you begin the game with a simple laser weapon, you can increase your ship's fire power by picking up pods left behind by destroyed enemy ships.

For those of you who really enjoy a challenging shoot-'em-up, Life Force offers multiple weapons and a wide variety of colorful enemies to battle throughout its six star-dotted terror zones. The game's sound effects are good, though not exceptional, and you can play with or without a musical soundtrack in the background. The M key serves as the toggle, although this feature, as well as the use of P to pause

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the game, isn't documented in the player's manual.

Besides the skimpy documentation, there are a few other things about Life Force you should know before visiting your software dealer. First, between levels and each time you restart the game, the screen flashes like a strobe light for about 20 seconds. It's tough on the eyes and gets annoying after three or four rounds. Second, the high-score board lists the ten best scores, but only until you shut off your C-64; nothing is saved to disk. Finally, Life Force is a one-player game, so head-to-head competition, or even cooperative play with a friend, is out of the question. As long as you're aware of these minor irritations when you hand over your cash, Life Force should give you your money's worth. *(Konami, 900 Deerfield Parkway, Buffalo Grove, IL 60089-4510. C-64/$29.95.)*

—BOB GUERRA
CHARLESTOWN, MA

TIME TO DIE C

A Text and Graphics Mystery for the Detective in You

Time to Die offers you a Calvinist course in predestination. An example of the hidden agenda you must follow begins with a ringing telephone on your office desk. If you don't answer

What will you do when the phone rings in Time to Die?

it, you can't leave the building! It's a loaded ante.

You may be a two-bit, scuffed-shoe detective, but you're not stupid; so you answer the phone. A scared voice tells you someone's in trouble, and it's you! Two thugs are hot on your trail.

What to do next? The software enlists your problem-solving talents to delve into this mystery, which actually means second-guessing the program designers about what they have in store for you. Your program offers you a limited number of choices, consisting of looking at things, picking up items, talking to people, dropping objects, climbing stairs, examining rooms, walking in different directions, giving things away, and so on. Combining verbs and nouns into simple sentences, you command the computer to do such things as "tell man to give book to woman." If your computer doesn't understand you, which is often, it will tell you so.

The program draws a colorful new scene each time a change occurs. Basically static, your on-screen graphics occasionally show a small animated item, such as your phone jiggling up and down. Unfortunately, action occupies only about one-fourth of the screen; the rest of your display lists verbs and nouns you can use in conjunction with your joystick's on-screen cursor. You can also type in commands on your keyboard.

A quick-save feature lets you store a game so you don't have to start at the beginning when you die, but there were times when this option went crazy and caused my disk drive to hiccup interminably. When this happened, everything on my screen except the cursor froze, and I'd have to reboot the program.

A zingy narrative keeps your pulse surging: "The bullets are whizzing over your head. You hit the back of the chair, like Bulldog Turner taking out a linebacker, and roll. More shots whine overhead."

If you're a fan of lively interaction, you'll enjoy joining Sam Harlow searching for clues, questioning suspects and gathering evidence. However, if you like more depth and less imagery, you're better off with a product from Infocom. If you're a true hard-boiled type, why not curl up with a good mystery thriller? *(Mastertronic, 18001 Cowan St., Irvine, CA 92714. C-64/$14.99.)*

—JOHN DIPRETE
CRANSTON, RI

THUD RIDGE ..... E

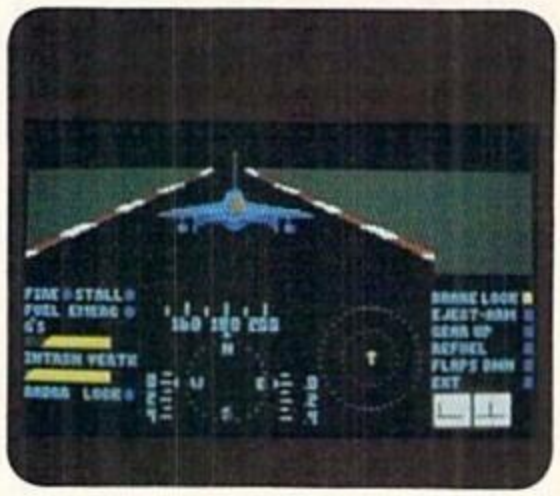
A Bombing Mission That Doesn't Make the Grade

This is perhaps the toughest review I've ever had to write. Unfortunately, that's because I can't find anything good to say about the program.

Thud Ridge is supposed to be a flight/combat simulation that places you—as pilot of a modified F-105 Thunderchief—in the thick of Vietnam War action. The "Thud," as this aircraft was affectionately known, was one of America's most effective weapons against the surface-to-air missile and radar sights of the Viet Cong, quickly gaining a reputation as a tough and reliable combat vehicle. The software revolves around six missions that range from leaflet dropping to ship interdiction. In addition, each mission can be flown at various difficulty levels, based on the rank of the pilot.

The view from the cockpit is not what you would expect from this type of simulation: while there are cockpit controls (engine gauges, weapons, altitude, and so on), the view is that of your F-105 from behind and slightly above the aircraft. Needless to say, this orientation greatly reduces any feeling of flight Thud Ridge could have mustered. Perhaps I could have overlooked this feature if the aircraft had been nicely rendered, but it's not. It's shown as a rather blocky, oversized sprite in the middle of the screen, superimposed over landscape graphics that are chunky and poorly defined. You must use a joystick or keyboard to control the pitch and bank of the aircraft, and this control is extremely awkward. Aircraft response to the joystick is slow and cumbersome, and it's often difficult to determine whether the aircraft is turning, climbing or diving (until you hit the ground, that is).

Weapons include missiles, bombs and a cannon, and you'll need a different



Thud Ridge's Vietnam War action in an F-105 Thunderchief.

mix of these, depending on the mission you've been assigned. Once you take off from an airport (if you want to call the poorly depicted sequence a "take-off"), you must "run the ridge" to reach your target. This ridge is supposed to be a mountain valley that separates Hanoi from your base, and is represented by a series of simple vector lines. Here ►

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you'll run into the deadly surface-to-air missiles you must face before proceeding with your mission. Thankfully, the authors saw fit to add "cheat" keys that automatically set your altitude, or advance you to the ridge or other landmarks. I'd like to shake the hand of the person who has actually navigated himself there with this program.

I'm becoming more and more suspicious of C-64 programs that are in packages with Amiga or Atari ST screen shots on the back, as is the case with Thud Ridge. Are they trying to save money, or is the manufacturer ashamed to put C-64 screen shots on the package? I suspect the latter.

A program of this caliber might have been acceptable in 1985, but certainly not in 1990. On the plus side, and to be fair, the opening title screen is nicely done. *(Three-Sixty Pacific; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$34.95.)*

—JOHN RYAN
BILOXI, MS

SUPERMAN ..... B

The Man of Steel has arrived on the computer game screen. In his latest incarnation, Krypton's native son goes up against longtime foe, Lex Luthor, who has teamed up with the extraterrestrial Darkseid. The bald-pated villain and the would-be deity attempt to kill Superman, destroy a S.T.A.R. Laboratories satellite and set themselves up in authority over the earth.

This software is part comic book (with panels and word ballons), part arcade sequences. Each panel's text is activated and scrolls across the bottom of the screen.

Upon completion of his mission, Superman's final score is displayed. On two double-sided disks, the program entails a lot of disk-swapping, but that doesn't interfere with the game's enjoyment. As for game play itself, there is, unfortunately, nothing truly innovative about "The Man of Steel," as the arcade sequences are rather standard exercises, utilizing Superman's various powers (flight, strength, heat vision, and so on) to dispense with his adversaries.

Where the software succeeds is that it lets the gamer play all six levels every time. It's not necessary to win on one level before advancing to the next. Also, Superman has no extra lives—an on-screen gauge indicates how much power Superman has left.

I personally feel the only drawback is that there's no comic packaged with the game that chronicles the Man of Steel's computerized adventure. *(Intracorp, 14160 SW 139th Court, Miami, FL 33186. C-64/$29.95.)*

—BOB SODARO

DARK SIDE ..... C+

Dark Side employs Freescape, which is a concept in 3-D perspective, to heighten the illusion of on-screen depth-consciousness. Sophisticated graphics land you squarely in the middle of your surroundings.

You have an outdoor view of a military outpost, situated on a rival planet's world. The alien turf reveals laser-mounted towers, secret tunnels, fueling stores, weapons devices and teleportation units on every side of you.

Since you are an invisible participant, nothing appears except for what you see. You have no alter-ego on this nightmarish satellite.

You must "turn" yourself at different angles to see in other directions, enter doorways to peek into buildings and use your jet power pack to rise and go forward. With a keystroke, you can adjust the angle of your turns, as well as lengthen the size of your forward strides. Changing your body's position in any way manipulates the components of your graphics perspective.

Pressing the space bar switches you from Movement to Firing mode, but I often found this operation sluggish. Also, the information panel's letters and numbers aren't easily deciphered; certain parts seem cut off, with the O's resembling U's.

The program's animation doesn't flow—it's quick, but halting. Thankfully, continuous scrolling helps the action.

Unfortunately, the lower information console chews up too much scenery, almost swallowing the basic action graphics. In addition to that, it's dark on the rogue moon Tricuspid, and you almost need a flashlight to probe the nighttime scenery.

With all its pluses and minuses, Dark Side offers angular momentum and depth. *(Cinemaware; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$29.95.)*

—JOHN DIPRETE

ZERO GRAVITY ..... C+

Continuing the tradition of Pong, Breakout and Arkanoid, Zero Gravity includes a fresh approach to the ball-and-paddle genre, but most players will probably pass it up in favor of similar games.

According to the instruction manual, the program is a futuristic hybrid of volleyball and tennis, supposedly simulating an exercise popular during weightless interstellar journeys.

You compete against another person or the computer, and the playing field is split horizontally to show both players' viewpoints. The paddle you control appears in the top half of the screen, while your opponent's actions are displayed in the lower half.

A game begins with a ball hurtling toward you. If you strike it squarely, the sphere shrinks in your part of the screen as it flies toward the other player's paddle. Making the game more difficult are the bounces the ball takes off the playing field's ceiling, floor and walls. Striking certain side panels also adds more complexity to the contest by awarding bonus points, speeding up the ball or taking away a goal from a player.

The software's graphics and animation are well done. The sound effects are also good, although the instruction manual is incorrect when it states that digitized speech is included.

A more serious shortcoming is the lack of variety. Players who've been spoiled by the more than 30 different Arkanoid screens will probably be disappointed by Zero Gravity's single playing field.

Also, with this program, you have almost no control over the ball's direction. As a result, you earn a victory merely by reacting well, not by developing sound tactics.

Zero Gravity is an interesting example of a genre that's become a perennial favorite. As such, the program may appeal to those individuals who won't mind its relatively passive approach to gaming. *(MicroDeal, U.S.A., 576 S. Telegraph, Pontiac, MI 48053. C-64/$29.95.)*

—WALT LATOCHA

LICENCE TO KILL ..... C–

To date, software adaptations of James Bond films have lacked the gimmicks, glamor and glitz of the originals. Unfortunately, Broderbund's Licence To Kill does nothing to change this.

The game contains six action screens, three of which are based on events that occurred in the film's pre-credit sequence. As the intrepid 007, you begin your adventure in a helicopter in pursuit of a car carrying a murderous drug smuggler. Along the way, you must avoid hitting structures or being shot

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out of the air by fire from enemy gun emplacements. Other trials include being pursued underwater by enemy divers and water-skiing barefoot behind a seaplane. Your final mission is to destroy big drug-filled rigs by attacking them from overhead in your crop duster.

Although the scenes scroll smoothly, and some of the graphics and sound effects are quite effective, for the most part the game's technical aspects are unimpressive. Often, lack of visual clarity hampers game play.

Game control is also a mixed bag. Maneuvering and firing from your helicopter are nearly effortless; controlling your Beretta is practically impossible. Due to the muddied visuals and the sloppy joystick control, you will waste many bullets.

Licence To Kill's documentation is woefully inadequate. Many on-screen objects aren't listed or their uses not explained. Other drawbacks include the lack of a game-continue feature and the inability to save high scores to disk.

Diehard 007 fans might find Licence To Kill entertaining, although my ten-year-old Bond devotee threw in the towel after 15 minutes. On a scale of 001 to 009, this James Bond offering receives a mere 003. *(Broderbund Software, Inc., 17 Paul Drive, San Rafael, CA 94903. C-64/$19.95.)*

—LEN POGGIALI

HEROES OF THE LANCE C

The object of this game is to lead eight "Companions" of the Lance on a quest to recover the Disks of Mishakal from the ruins of Xak Tsaroth. This will restore people's faith in the old gods and prevent the Queen of Darkness from creating an evil empire.

You must battle and spell-cast your way through three levels of ruins, sewers and a maze. Your party of adventurers will face draconians, gulley dwarves, black dragon hatchlings, giant spiders, spectral minions, trolls, wraiths and human fighters.

At first glance, SSI seems to have succeeded in creating a game that appeals to both serious role-playing fans and joystick-wielding action addicts. All of the traditional role-playing elements have been preserved, and everything can be accomplished using a joystick. However, neither group is likely to be thrilled by Heroes.

Joystick response is slow and disk-access time is long when changing the lead character. Also, success really depends on the ability to choose the correct lead character for each situation; this skill only comes with careful study of your characters' traits, and with much trial and error.

Heroes of the Lance is overly simple, and its singular quest to recover the Disks of Mishakal is sure to leave many traditional FRP fans asking "Is that all there is?" The proper balance needed to satisfy both RPG and action audiences may be more elusive than a blue healing potion. *(Strategic Simulations, Inc.; distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. C-64/$29.95.)*

—BOB GUERRA ■

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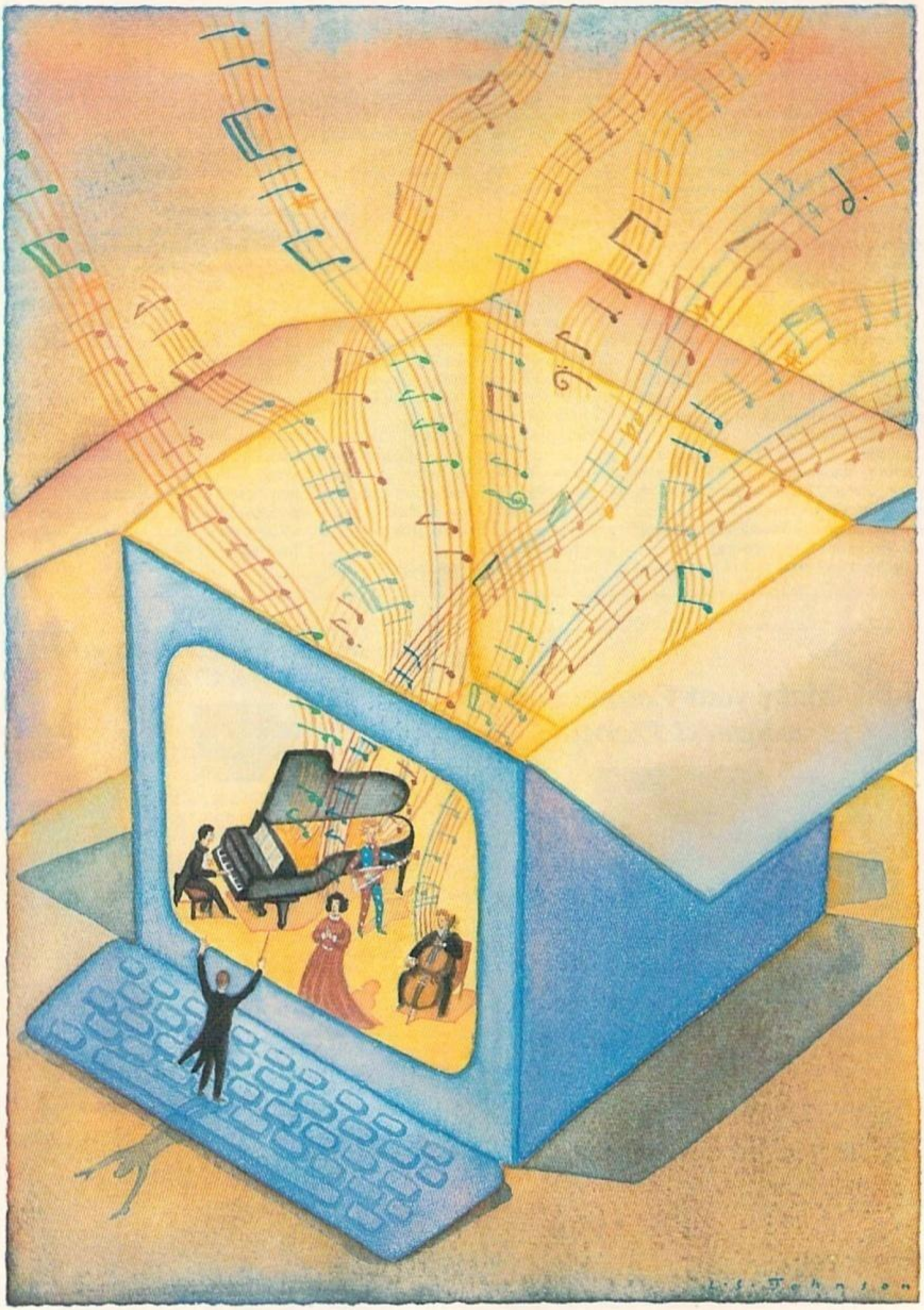

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Bach to The Future

Your Commodore can take you

on a musical journey through the decades,

from Mozart to Madonna and beyond.

With the rising popularity of 16-bit computers, few folks outside the Commodore community realize that the C-64/128 has its own formidable music generator: the Sound Interface Device, or SID chip. This IC was ahead of its time when the computer was released in 1982, and it still makes the Commodore one of the most capable music machines available. Of course, using the chip requires software, so what programs are available to drive it today? Read along and we'll head down the Commodore music road to find out.

Tuning Up

Electronic Arts' Music Construction Set (MCS) was the first powerful music-editing program to appear for the Commodore—a wonderful achievement and a godsend to Commodore musicians. While taking advantage of some of the more advanced features of the SID chip, MCS is easy to use, lets you edit in real time and provides instantaneous feedback.

The editing screen features treble and base clefs (a grand staff), with a keyboard- or joystick-controlled pointer and icon boxes to select program functions. To create music, you "pick up" notes, sharps, flats, naturals, ties and rests and place them on the clefs, shifting between octaves as you wish. You can play back your score at any time, and then use MCS's cut-and-paste function to change it if needed. You can even cut measures from other works and insert them into your current project.

Other MCS features support octave control and "instrument" selection. You can set a sound gauge to any one of 13 different configurations, eight of which sound akin to traditional instruments, such as the flute and harpsichord, while the remainder produce percussion sounds and other special effects.

Deluxe 16-bit versions of this program now enjoy a wide following, but MCS for the Commodore 8-bit machines is not as popular as it once was. Although it's easy to use, the quality of the music it produces is average at best; there's just not enough control of the SID chip features. Moreover, it's becoming difficult to find new MCS music files on the BBSs and national online networks, which were hitherto the major sources of such files.

All in all, MCS is an excellent program for starting down the Commodore music road, but seasoned composers may soon find it limiting.

In the Studio

A more ambitious program is The Music Studio from Mediagenic. This group of related programs takes a "tool-kit" approach to musical composition, providing more variety and quality than does MCS. The Music Studio is also MIDI-compatible and can print out compositions.

The key to The Music Studio is its editor. Like that ►

By JOHN RYAN

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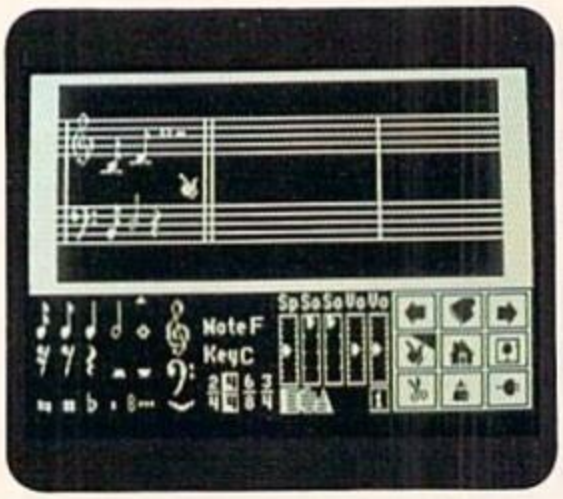
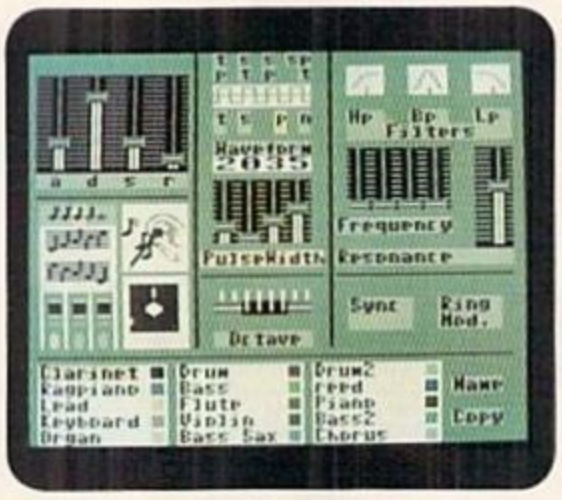


Write your music on the grand staff of Music Construction Set.



The Music Studio's impressive sound engineering room.

Commodore Software Showcase
SUBJECT: C-64 SID : 01-18-90 #1
TYPE: seq
BLOCKS: 84
DOWNLOADS: 18
EST. D/L TIME: 300: 18:59 1200: 05:25
FILES NEEDED: Sequential file reader
This sequential file contains the complete descriptions of files added to the C-64 Music: SID Libraries during the week ending 01-18-90
<< PRESS F7 FOR DOWNLOAD MENU >>
MAIL

QuantumLink gives you a wealth of music files to download.

of MCS, it provides a grand staff along with controls for placing notes and rests. Unlike MCS, it lets you accompany your musical notation with up to four verses of lyrics.

You can play your Music Studio compositions using 15 different instruments. If you don't like the way a particular one sounds, you can change it by adjusting the attack, decay, sustain and release (ADSR) values, the waveform values and various filter settings, as well as resonance, synchronization and ring modulation, either note by note or section by section.

If you're not a musician, you'll appreciate The Music Studio's Paintbox feature, an innovative approach to free-form composition. All you have to do is "paint" colored rectangles up and down a staff, with the length of each rectangle specifying the sound to be played and the color specifying the instrument to be used for that sound. The Paintbox is a real shortcut, and you can even transport compositions generated with it into The Music Studio's regular editor.

The Music Studio is an excellent compositional tool that provides more control than MCS, so you'll produce more with it sooner. Its sound quality is also better, and the Paintbox feature is a boon to novice musicians. The excellent documentation is indexed for easy reference.

Sing Along with SID

Perhaps the most popular music composition and playback program today is Craig Chamberlain's Enhanced Sidplayer for the C-64 and C-128. It is also, in my view, the most sophisticated and powerful music program available thus far.

Sidplayer comes on a double-sided disk with the C-64 version on one side and that for the C-128 on the other. Accompanying the disk is a 274-page, wire-bound manual. The editing features of this program give you total control of the SID chip. Not only can you choose a pitch, waveform and envelope for each of the Commodore's three voices, you can also control filtering, modulation, vibrato, portamento, transposition, and more. If you prefer, the program will filter automatically. Enhanced Sidplayer is so versatile that the files it generates can be merged with your own Basic programs to provide background sound.

Like the other composition programs, Sidplayer has an editor that lets you place musical notation on a grand staff, cut-and-paste, search and play your music back. However, Sidplayer takes the art of composition further. The excellent documentation delves deeply into modulation, filtering, music theory, and more, while guiding you step by step through the music-making process.

A small, stand-alone player program that comes in the Sidplayer package lets you play the literally thousands of Sidplayer files available for downloading from public domain sources such as Q-Link and GEnie (see *RUN*, February 1990, page 27). You'll find everything from the latest pop hits to classics, from single numbers to whole albums; and most of these files are superb. Q-Link members can also "play" Sidplayer files directly off the network through a wonderful service called The Music Connection. Q-Link has the most active Sidplayer user base of any information service.

In addition to standard Sidplayer files, stereo files are

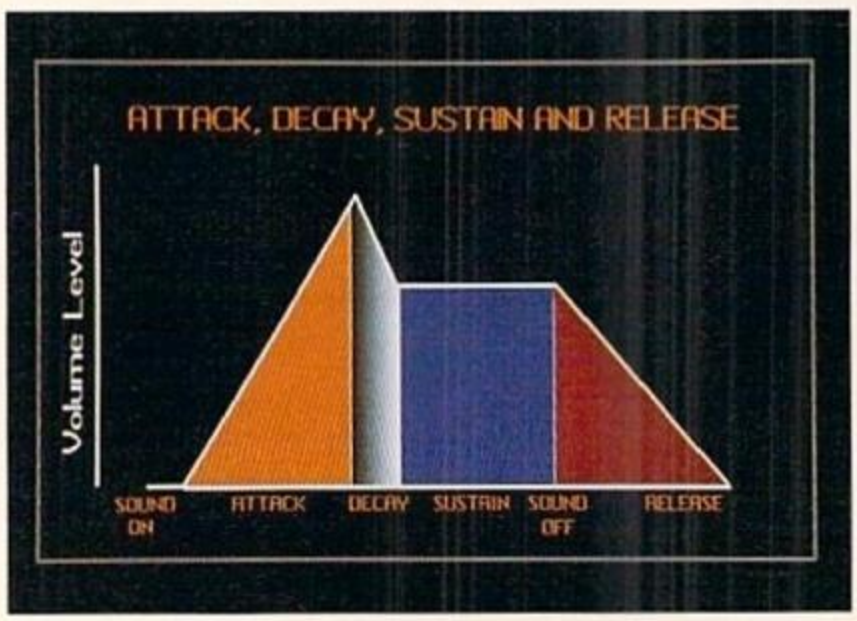
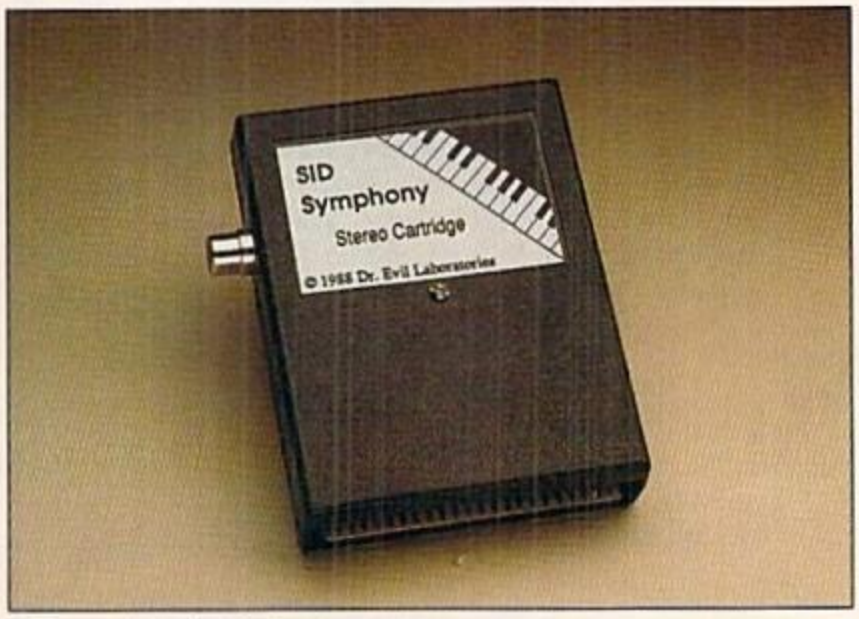


Diagram of ADSR sound pattern.



The cartridge that brings you stereo.

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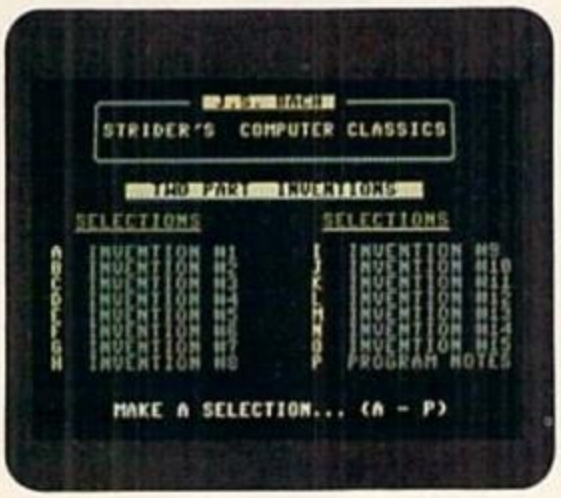
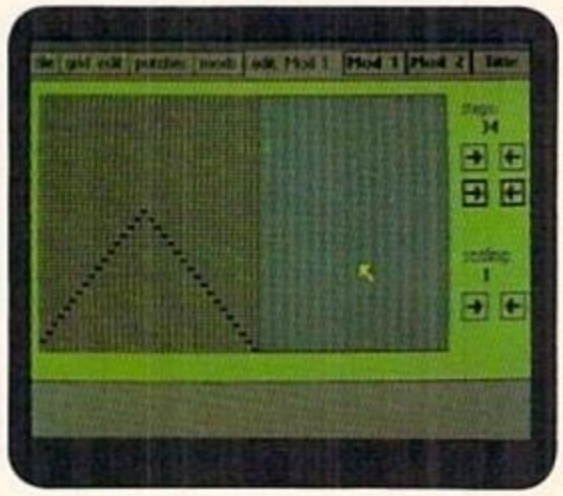


The selections on one of Free Spirit Software's music collection disks.

Another Free Spirit disk features gospel hymns.



***RUN*'s GEOS Companion disk provides the G.O.Bach editor for both the C-64 and 128.**

available through the online services. However, since the C-64/128 can't produce stereo sound, you must install a hardware device to enjoy the six voices stereo provides.

The simplest such device is the SID Symphony Stereo Cartridge, available from Doctor Evil Laboratories. Plugged directly into the expansion port, it outputs three additional voices to an external amplifier and speaker. The original version of the cartridge was powered by a 9-volt alkaline battery connected to the external system with a simple RCA male-to-male cable. A new version of the cartridge is now powered directly from the user port. The price of the new one has not yet been announced.

Having tested this little gem for three months, I'm now spoiled by the addition of stereo to my C-128! Sidplayer files ►

SID: The Music Master

THE SOUND INTERFACE DEVICE, or SID chip, is the basis of the Commodore music capability. Unlike a traditional instrument, where you blow through a mouthpiece, draw a bow across a string, or strike a surface, SID creates sound digitally—through high and low voltages, on and off bits. However, the end result, when the electronic pulses are sent to a speaker, is still the same: vibration in the air and in your ear.

The frequency of a vibration determines the *pitch* of the sound it produces, while its *waveform* determines the quality, or timbre, of the sound. Waveform differentiates the sound of a violin from that of a guitar or a flute from a piano.

The SID chip contains three oscillators and waveform generators that produce the Commodore's three voices, and the voices can sound at various frequencies in four waveforms: square (pulse), triangle, sawtooth and noise. The triangle yields a soothing sound and the sawtooth a crisp sound, while the noise waveform can produce everything from gravelly rumbles to high-pitched hisses—the noises ordinarily used for sound effects.

The attack, decay, sustain and release (ADSR) envelope further defines a sound. The easiest way to understand ADSR is to imagine a clap of thunder. The *attack* is how quickly a sound reaches maximum volume; a thunderclap has a very fast attack because it reaches full volume almost instantly. The *decay* is how fast the volume slides from the maximum level to a *sustain* level, where it holds steady or slides more slowly; a thunderclap decays slowly, gradually fading away into the distance. *Release* is how fast the volume finally drops off to zero.

With the C-64, when programmers want to produce sound with the SID chip, they must specify all these characteristics for each vibration in each of the three voices by poking values into various registers. These include the ADSR, pitch and volume registers, as well as a gate bit that enables the sound to be heard. Producing sound effects may require accessing some of the more complicated features of the SID chip, such as filtering, which allows only selected frequencies to pass, ring modulation, synchronization and resonance.

In most cases, the Pokes must be done in a prescribed sequence. For example, you must turn on the volume control and specify a waveform before you enable the sound, or you may hear nothing at all. And you can't place random numbers into these registers, either. The SID chip can produce a lot of sounds—65,536 in eight octaves, to be exact—but you can place only predefined or formulated values in the registers, or you may get unexpected results.

On the other hand, all C-128 programmers have at their command a superior Basic that eliminates the drudgery of poking values into registers. With Basic 7.0, all you have to do is specify the values through the Vol, Sound, Play, Envelope, Tempo and Filter commands. For example, the statement SOUND 3,49000,200, 1,0,100,1,0 replaces several long lines of C-64 Basic.

The Commodore Sound Interface Device is a wonderfully complicated support chip that can produce sounds from laser blasts to flowing sonatas. Programming the chip entails an understanding of music theory, SID architecture and, of course, writing code. And if you don't yet have that understanding, you can just load other people's music and enjoy. —JR

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must be written specifically to take advantage of this stereo capability, or they'll yield only mono output. Most public domain Sidplayer files state whether they are stereo.

Dozens of public domain support programs, along with documentation, are available for the Sidplayer and stereo cartridge. One versatile and powerful example is Stereo V1.0 (QuantumLink PD by Robert Stoerre, filename "Stereo.Arc"; or $5 per disk from Dr. Evil Labs, which, by the way, also sells the Enhanced Sidplayer system for $22.95, shipping and handling not included). Stereo V1.0 is a new Enhanced Sidplayer editor utility that allows you to edit all six voices at once (instead of Sidplayer's one voice at a time). Its other features include MIDI editing and playback, a built-in title and text editor and an easy-to-use, menu-driven interface.

No doubt, Sidplayer is the definitive C-64/128 music composition program for both the casual computer musician and the serious composer. If you don't want to create your own music, use it to enjoy the works of other computer musicians from all over the world.

Easy Listening

Free Spirit Software puts out a collection of Commodore transcriptions that you can "load and listen" to without having other software like Sidplayer. The collection includes more than a dozen disks, such as Music of the Masters and Strider's Computer Classics, containing music of Bach, Mozart, Beethoven, Handel, Haydn, Joplin and other composers, as well as gospel classics and popular Christmas selections. Some of these produce less sophisticated sound than Sidplayer and Music Studio files, but most of them are well done.

GEOS users now have access to superb music editors on *RUN*'s GEOS Companion disk: G.O.Bach 40 for the C-64 and G.O.Bach 80 for the 128. These fast, powerful music editors have user interfaces that are unusually well designed. Moreover, on the disk—and accessible from within the programs—are prerecorded sound tracks to provide rhythm for your musical compositions.

There are fewer C-64/128 music programs available today than even a year or two ago, but, armed with any one of those I've described here, both the novice composer and the expert can produce excellent results in a short time. Pick up some sheet music at a local store and transfer it to computer format, or try writing your own compositions. Either road to Commodore music will be fun and rewarding. ■

John Ryan, an air traffic control instructor by profession, moonlights as one of RUN*'s contributing editors.*

Table 1. Product information.

The Music Studio
Mediagenic
3885 Bohannon Drive
Menlo Park, CA 94025
No longer available from the manufacturer; check user's groups, used merchandise ads and mail order firms

The SID Symphony Stereo Cartridge
Dr. Evil Laboratories
PO Box 3432
Redmond, WA 98073-3432
$34.95

Music Construction Set
Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
$14.95

Enhanced Sidplayer
Compute! Publications, Inc.
PO Box 5406
Greensboro, NC 27403
$24.95

Music of the Masters, Strider's Computer Classics, and other selections
Free Spirit Software
PO Box 128
Kutztown, PA 19530
$5 each

QuantumLink
QuantumLink Computer Services
8620 Westwood Center Drive
Vienna, VA 22180
Subscription, $9.95 per month; 8¢ per minute for Plus services (300/1200 baud)

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Table 2. Suggested reading from Compute! Publications, Inc., PO Box 5406, Greensboro, NC 27403.

Compute!'s Beginner's Guide to 64 Sound
John Heilbom
$12.95

Music System for the Commodore 128 & 64: Enhanced Sidplayer
Craig Chamberlain
$24.95

Compute!'s 128 Programmer's Guide
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All About the C-64, Vol II
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$16.95

64 Sound and Graphics
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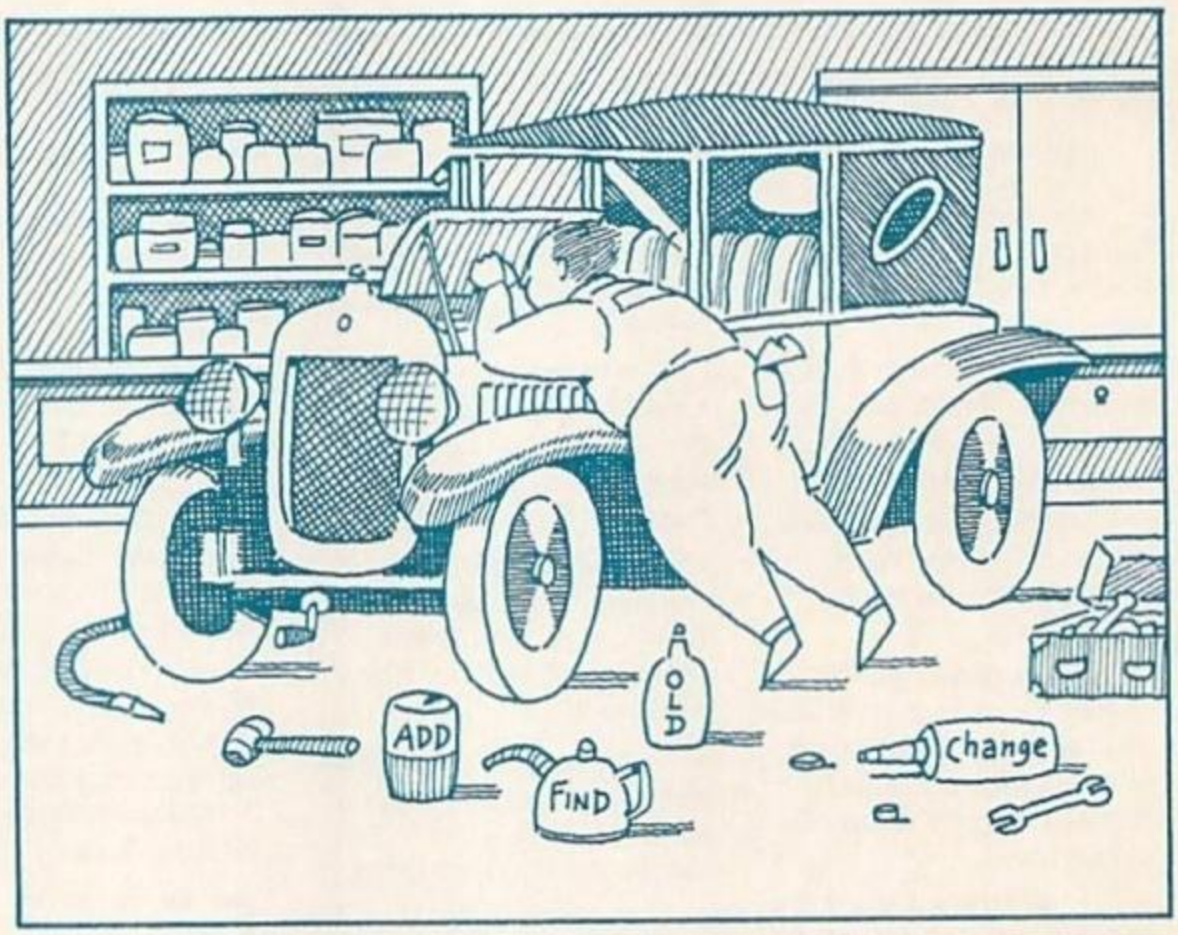
128 Basic Enhancer

Here are four handy commands to help you write or edit programs.

By JIM BORDEN



Writing computer programs is enough of a challenge without all the typing that's necessary. The AFCO utility cuts down on that typing—and lets you rescue accidentally "Newed" programs—by adding four commands to the C-128's Basic 7.0 editor. With AFCO, you can Add (append) a program or subroutine to the program in memory, Find or Change text in that program or Old (un-New) a program.

Type in Listing 1 and save it to disk with the name AFCO.BAS. Then run it to write AFCO.ML, the machine language code, to the disk. To use AFCO, either boot AFCO.ML or BLoad it into bank 0 and enter SYS 5380 to activate its wedge. Also type in and save the demonstration program and subroutines in Listings 2, 3 and 4, being sure to enter NEW before starting each one.

Now, here's a description and several examples of each AFCO command.

ADD

The Add command appends a Basic subroutine or program (from drive 8) to the end of the program in memory and adjusts the pointers as required. Using Add requires some planning on your part to ensure proper use of variables in the subroutine you're adding. To that end, I suggest that you keep a record of your subroutines, noting any variables used, the starting and ending line numbers, what data must be passed from the main program to the subroutine and what data will be passed back after the subroutine is finished. The starting line number must be written into any main program to which you add the subroutine.

The syntax for the Add command is simply: ADD "filename". Line numbers aren't important to the Add routine, but be sure to add the *lowest* numbered subroutines first, because new lines are added to the *end* of the program in memory. You can renumber later to clean up any gaps in the line number sequence.

Here's how to use the Add command with the programs in Listings 2, 3 and 4. With AFCO in memory, load the demo program (Listing 2) and list it, noting that it contains eight lines. Then type ADD "Subroutine 60000" on an empty line, press return and list the program again to see that the first subroutine (Listing 3) has been added to the demo. Finally, add the second subroutine by typing ADD "Subroutine 60100" and pressing return. Note that we added the lowest numbered subroutine first.

You could also have executed the Adds by listing the disk directory and just typing ADD over the number of blocks for the file desired; AFCO ignores anything after the second quote.

Now run the demo to see how the added subroutines work with the original. Don't renumber the demo yet, since later examples will refer to the original line numbers.

FIND

The Find command lets you locate all occurrences of a string, variable or keyword in a program listing. To use the command, the text you're seeking must be delimited by quotes, periods or colons. Use quotes when you're looking for text within quotes, and periods or colons when you want to find variables or keywords. Here's an example of the latter:

FIND :X4: ►

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You might need to use both quotes and another delimiter (one at a time) to find *all* occurrences. (Printed text is usually in quotes, while remarks usually are not.)

With the demo program and subroutines still in memory, now type

```
FIND "TO"
```

and press return. This should list line 30 with the text TO in a different color. Note that the keyword TO (outside quotes) was not found. Typing

```
FIND :TO:
```

again should show line 60110.

If more than one match is found in a line, the line will be listed more than once, each time in a different color.

CHANGE

To alter text in your program listing, use the Change command. The syntax for Change is similar to that for Find, but a second string follows the "Find" string and a third delimiter is required. If quotes are used as the first and third delimiters, a colon should be used in the middle to prevent the second string from being tokenized.

Here are three examples of the Change syntax:

```
CHANGE .PRINT.PRINT#4,.
CHANGE "TON:TIN"
CHANGE :ER:EX:
```

The second example won't let the strings be tokenized, because the colon in the middle is accepted as a special delimiter. The third example shows how you might change a variable throughout a program. You might use this, for example, in a case where a program written for the C-64 is being updated to run in 128 mode.

You'll be prompted Y/N/E for Yes/No (change/don't change) or Exit at each match found. If you want all matches changed (are you really sure?), just hold down the Y key.

To avoid finding strings that are parts of other strings, use spaces in the text. For example, if you want to find IS, use " IS" to avoid finding "THIS".

To see a demonstration of Change, enter

```
CHANGE .Y2.Q.
```

When lines 50, 60, 60090 and 60110 are listed, one at a time, press Y after each prompt to change the variable; then, after you're done, list the program to see that the lines actually did change.

Change will turn a short string into a longer one or a long string into a shorter one, and it will adjust all pointers within the program. Note that both strings must be at least one character long.

Always use common sense and caution with the Change command; otherwise you may change more than you intended!

DISPLAY NOTES

When you're using either Find or Change, each line containing the requested string will be printed to the active output device, usually the screen. To help show the match on the line and avoid the editing problems caused by using reverse video (as with the 40-column Help command), I've made the string appear in a different color. If the matches are invisible on your screen, change the background or text color and try again.

After a line is listed, the remainder of the screen line is cleared to avoid confusion and aid in editing. The text can be highlighted and edited on the same line with no strange results.

If you're using an 80-column screen, you'll find that matches are always printed in uppercase. This is because I always work in upper/lowercase, so the uppercase makes matches even easier to spot, with no interference with editing.

To output to your printer, open the printer as you normally do and issue a CMD4 to send all output to it—for example,

```
OPEN 4,4,7:CMD4
```

Then press return and type your Find command as usual, and all lines containing matches will be printed out. To keep the program compatible with any printer, use the square brackets ([ ]) to enclose the match.

Sending output to the printer is useful mainly when more matches will be found than will fit on the screen.

OLD

If you accidentally "New" a program, the Old command will restore it for you. To see how Old works, type NEW, press return and list the demo program. To retrieve the program, type OLD on an empty line, press return and list the program again to confirm that it's been restored. The Old command must be used *before* you enter any lines after the New command!

If you "New" a program when AFCO isn't active, just boot AFCO.ML and type OLD to restore your program.

The AFCO commands are real time—and program—savers. I'm sure that once you try them, you'll always want them available to help write and edit your Basic 7.0 programs. R

Jim Borden is a tool maker by trade, a freelance programmer and a former RUN *Magic columnist.*

Listing 1. AFCO program. (Available on ReRun disk. See order card facing page 24.)

```
Ø REM THIS LIST 1 CREATES (AND
  SHOULD NOT BE CALLED) AFCO.ML
                          :REM*69
5 OPEN 8,8,8,"AFCO.ML,P,W"
                         :REM*246
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:PRINT:PRINT"ALL DONE!":EN
  D                      :REM*129
12 PRINT"{HOME}READING LINE "+S
  TR$(CT):CT=CT+1        :REM*141
15 IF LEN(A$)<62 THEN 55
                         :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)     :REM*242
25 FOR I=1 TO 3Ø         :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                         :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55              :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55              :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                         :REM*67
5Ø NEXT:GOTO 1Ø          :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 7Ø                   :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
  A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 7Ø             :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
  Ø)+RIGHT$(A$,LEN(A$)-42)
                         :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                         :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55              :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55              :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                         :REM*148
95 NEXT:GOTO 1Ø          :REM*16Ø
1ØØ REM MACHINE LANGUAGE FOR AD
    D/FIND/CHANGE/OLD C-128 UTI
    LITY                 :REM*148
1Ø1 DATA Ø415ADØ5Ø3C915DØØ16Ø*8
    D2215ADØ4Ø38D2115A2*2ØAØ158
    EØ4Ø38CØ5Ø36Ø        :REM*232
1Ø2 DATA 2ØØD43ADØØFF8DBF1AA2*F
    FE8BD9F1ADDØØØ2FØF7*EØØ3DØØ
    34CB719A2FFE8        :REM*2Ø8
```


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BASIC ENHANCER

```
103 DATA BDA21ADD000F0F7E003*D
    00834C581AA2FFE8BDA5*1ADD000
    2F0F7E004D007          :REM*185
104 DATA A9008DB91AF015A2FFE8*B
    DA91ADD0002F0F7E006*F00160A
    9018DB91ACAE8          :REM*250
105 DATA BD0002C920F0F8E88E8C*1
    58DBA1AA2FFE8BD0002*D00160C
    DBA1AF01FA8AD          :REM*253
106 DATA BA1AC922D011C03AD00D*8
    A186D8C15A8A92299000*02D0069
    89D000CD0D58E          :REM*245
107 DATA BB1AADB91AF031E88A18*6
    D8C158DCA15A2FFE8BD*0002D00
    160CDBA1AF005          :REM*232
108 DATA 9D800CD0EF8EBC1A8A38*E
    DBB1A8DBD1A3003A900*2CA9FF8
    DBE1AADBB1AF0          :REM*124
109 DATA 12C930B00E2CB91AF00A*A
    DBC1AF004C9319001600*ACB91AC
    8A203E8BD0002          :REM*43
110 DATA CDBA1AD0F7881F4E8BD*0
    002D0E7AEBB1ACABD00*0C9D000
    2CA10F7AEB91A          :REM*233
111 DATA F00DAEBC1ACABD800C9D*8
    002CA10F7A52D8507A5*2E8508A
    9008DC01A8DC1          :REM*104
112 DATA 1AADB91AD0088D00FF20*E
    1FFF029A93F8D00FFA5*078505A
    5085506A0018           :REM*83
113 DATA B1058DC61A6DC01A8507*C
    8B105486DC11A8508680*0DC61AD
    00CADBF1A8D00          :REM*105
114 DATA FFA9008D0002602080A18*8
    DC71AA203E8BD000CD0*0EA0001
    8A5079105C8A5          :REM*23
115 DATA 089105D0A2C922D00A48*A
    DC71A49808DC71A68CD*0002D0D
    9ADBA1AC922F0          :REM*170
116 DATA 03A9002CA980CDC71AD0*C
    88EEC16A200E8ECBB1A*F018BD0
    002C922D00A48          :REM*239
117 DATA ADC71A49808DC71A68DD*0
    00CD067F0E2AE020CAD*030C205
    D17A9202D2FF           :REM*38
118 DATA A00084F48CCB1AA003C8*8
    CC81A204B18B9000CF0*24100F2
    4F4300BC9FFF0          :REM*164
119 DATA 0720D317A900F0E3C922*D
    00848A5F4498085F468*20D2FFA
    901D0D0A59AC9          :REM*159
120 DATA 03D003203A1820B219AD*B
    91AF00D20AA1818ADEC*166DBD1
    A8DEC16AEEC16          :REM*212
121 DATA 4C97168EC21A8DC31AA9*0
    08DC61AA210A9272090*17A2E8A
    903209017A264          :REM*93
122 DATA A900209017A20AA900200*9
    017AEC21AA900EEC61A*20C9176
    08EC41A8DC51A          :REM*192
123 DATA A200E838ADC21AEDC41A*8
    DC21AADC31AEDC51A8D*C31AB0E
    AADC21A6DC41A          :REM*201
124 DATA 8DC21AADC31A6DC51A8D*C
    31ACA8AD005ADC61AF0*09EEC61
    A8A093020D2FF          :REM*173
125 DATA 600CC61AC9FED006A900*A
    046D008C9CED01BA9C8*A046EEC
    61ACECB1A8524          :REM*233
126 DATA 8425EEC81AACC81AB900*0
    CAACAD00CA2168624A2*4486253
    8E97FAAA000CA          :REM*113
127 DATA F00EB1241003CAF007C8*D
    0F6E625D0F2C8D002E6*25B1243
    00A20D2FFC8D0          :REM*137
128 DATA F6E625D0F2297FACC61A*2
    0D2FF60A59AC903D00A*A91B20D
    2FFA9512D2FF           :REM*163
129 DATA 60CCEC16D022ADBB1A8D*C
    B1AEECB1AA59AC903D0*0EA6F18
    E7E18E88A290F          :REM*171
130 DATA 85F1189005A95B20D2FF*C
    ECB1AD012A59AC903D0*07A9008
    5F1189005A95D          :REM*68
131 DATA 20D2FF60A93F8D00FFA0*0
    2B10599000CC8B10599*000CC8B
    10599000CD0F8          :REM*251
132 DATA A9008D00FF60A200BDA9*1
    A20D2FFE8E01D0F5A5*9AC903D
    005A9912D2FF           :REM*107
133 DATA 20E4FFC94EF01C959F0*1
    4C945D0F1A9008D0002*8DB91A6
    868203A184C57          :REM*15
134 DATA 1720 3A18A93F8D00FFA9*0
    08D6B198D6719ADBD1A*D0034C7
    A19100A49FF18          :REM*98
135 DATA 6901 8D6719D0038D6B19*1
    8ADEC1665058524A506*690085 2
    5AD11128527AD          :REM*37
136 DATA 10128526186DBD1A8D10*1
    2AD11126DBE1A8D1112*18ADBD1
    A6DC01A8DC01A          :REM*252
137 DATA ADBE1A6DC11A8DC11A18*A
    DBD1A6507850 7ADBE1A*650885 0
    82CBD1A300FA2          :REM*237
138 DATA 01B52448B52695246895*2
    6CA10F3A000B124A000*9124A42
    4C426D025A425          :REM*230
139 DATA C427D01F18ADEC166505*8
    524A506690085250 00*B98002 9
    124C8CCBC1AD0          :REM*33
140 DATA F5208A1860 2CBD1A300B*A
    524D002C625C6244C66*19E624D
    002E6254C6619          :REM*43
141 DATA A9D4CD2FFCAE8BD000 2*C
    920F0F8E88ECB198DBA*1AA2FFE
    8BD002D0016 0          :REM*99
142 DATA CDBA1AF0059D000CD0EF*8
    EBB1AA9008D00FFADBB*1AA200A
    00C20BDFFA900          :REM*204
143 DATA AA2068FFA900A2080A820*B
    AFF38AD1012E902AAAD*1112E90
    0A8A9002 0D5FF         :REM*30
144 DATA B00C8E1012 8C11122 04F*4
    F4C8316249010182 0B2*19A200B
    D7D4808297F20          :REM*103
145 DATA D2FFE8281 0F320B2194C*8
    3162 0B219A9082 0B4FF*A96F209
    6FF20A5FFC900D         :REM*219
146 DATA F0052 0D2FFD0F42 0D2FF*2
    0ABFF4C8316A93F8D00*FFA52D8
    524A52E8525A0          :REM*34
147 DATA 00B124C81124F0034C83*1
    6A525912488B124D009*E608A5 0
    8C903F00B2C84          :REM*11
148 DATA 08E624D0EDE625D0E9A9*0
    08D00FFE624A624D002*E625A42
    54C0E1A414444          :REM*198
149 DATA 4F4C4446494E44434841*4
    E47453F20592F4E2F45*2007 0D
                           :REM*105
150 DATA -1                :REM*4
```

Listing 2. AFCO demo program. (Available on ReRun disk. See order card facing page 24.)

```
10 REM AFCO DEMO PROGRAM:REM*22
20 SW=40:AZ$="THIS IT A SHORT D
   EMO":GOSUB 60000:REM PRINT W
   ITH 1ST SUB             :REM*12
30 AZ$="TO SHOW THE AFCO":GOSUB
    60000                  :REM*141
40 AZ$="FUNCTIONS.":GOSUB 60000
                           :REM*83
50 X9$="{UP ARROW)":Y2=SW-1:R9=
   1:GOSUB 60100:REM CHAR REPEA
   T WITH 2ND SUB          :REM*6
60 X9$="=":Y2=20:R9=0:GOSUB 601
   00                      :REM*156
70 END                     :REM*198
80 REM{2 SPACEs}--SUBS---
                           :REM*72
```

Listing 3. First demo subroutine. (Available on ReRun disk. See order card facing page 24.)

```
59980 REM "SUB 60000" - CENTER
      STRING               :REM*6
59990 REM STRING=AZ$:SCREEN WID
      TH=SW                :REM*112
60000 PRINTSPC((SW-LEN(AZ$))/2)
      AZ$:RETURN           :REM*18
```

Listing 4. Second demo subroutine. (Available on ReRun disk. See order card facing page 24.)

```
60080 REM "SUB 60100" - REPEAT
      CHARS                :REM*17
60090 REM CHAR=X9$:NUMBER=Y2:RE
      VERSE ON IF R9<>0:REM*124
60100 IFR9 THENPRINT"{CTRL 9}";
                           :REM*82
60110 FOR X9=1 TO Y2:PRINTX9$;:
      NEXT                 :REM*93
60120 PRINT:RETURN         :REM*98 ■
```

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Doing the Alphabet Shuffle

Take enough steps in the right directions to put this letter puzzle in order.

By CHARLES PHOENIX

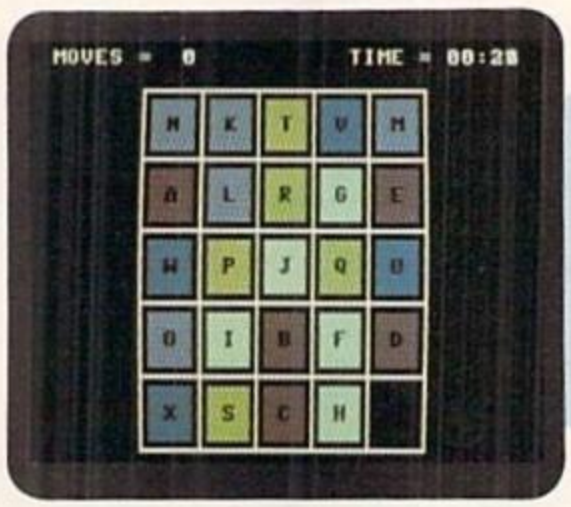
Alphabet Shuffle is a strategy game in which you alphabetize a grid of randomly placed letters by swapping them, one at a time, with a blank space. It's based on the little sliding-number puzzles you probably know and offers three skill levels, with eight, 15 and 24 letters. You move the letters with a joystick plugged into port 2. The program (Listing 1) is written entirely in Basic.

At the opening screen, you select your choice of skill level with the joystick and press the firebutton to call up the brief on-screen instructions. The program sets up your puzzle, and when it appears, press the firebutton to start play.

You can move only those letters that are adjacent to the blank space. Decide which letter you want to move, then press the joystick in the direction the letter should go, and it will swap places with the blank space. As you play, your elapsed time and the number of moves you've made are continuously shown at the top of the screen.

The game is over when all the letters are in alphabetical order and the blank space is last. After the closing score-and-time display, you can press the firebutton to play again at the same or another level. You can also press the firebutton at any time during a game to quit and bring up another puzzle. Remember that all moves are related, so it's important to think ahead. R

Charles Phoenix is a Canadian who was introduced to computers in grade school and has been programming ever since. He says he's thinking about upgrading his C-64 to an Amiga 2000.



You have to plan the moves well in advance to arrange the letters in order.

Running Instructions: **Type in Listing 1, save it to disk and run it.**

Listing 1. Alphabet Shuffle program. (Available on ReRun disk. See order card facing page 24.)

```
10Ø REM ALPHABET SHUFFLE                :REM*2Ø6
105 REM BY CHARLES PHOENIX (Ø1/
    89)                                 :REM*121
11Ø REM                                 :REM*253
112 GOTO45Ø:REM GOTO SETUP              :REM*48
114 REM                                 :REM*Ø
135 PRINTLEFT$(DN$,23);:REM PRI
    NT PROMPT AND WAIT FOR FIRE
                                        :REM*19Ø
14Ø PRINT"{CTRL 2}{5 SPACEs}PRE
    SS FIRE BUTTON TO CONTINUE.
    "                                   :REM*5Ø
145 IF(PEEK(JY)AND16)/16THEN145
                                        :REM*168
15Ø RETURN                              :REM*37
155 REM                                 :REM*43
17Ø PRINTLEFT$(DN$,VP+TX*4-4):R
    EM PRINT LETTER AT (X,Y)
                                        :REM*16
175 IFA$=""ORA$=" "THENPOKE646,
    Ø:GOTO185                           :REM*124
18Ø POKE646,2+(ASC(A$)-65)/GN
                                        :REM*7
185 PRINTSPC(HP+TY*4-3);"{CTRL
    9}{3 SPACEs}{3 CRSR LFs}{CR
    SR DN} ";RIGHT$(" "+A$,1);"
     {3 CRSR LFs}{CRSR DN}{3 SP
    ACEs}{CTRL Ø}"                      :REM*113
19Ø RETURN                              :REM*77
195 REM                                 :REM*83
21Ø M=Ø:TI$="ØØØØØØ":REM *** MA
    IN LOOP                             :REM*22Ø
215 X=GN:Y=GN                           :REM*189
22Ø OX=X:OY=Y                           :REM*126
225 REM                                 :REM*113
23Ø PRINT"{HOME}{CTRL 8}{3 SPAC
    Es}MOVES = {CTRL 2}";M
                                        :REM*118
235 PRINT"{HOME}{CTRL 8}{24 CRS
    R RTs}TIME = {CTRL 2}";MID$
    (TI$,3,2);":";RIGHT$(TI$,2)
                                        :REM*181
24Ø REM                                 :REM*126
245 IF(PEEK(JY)AND16)/16=ØTHEN3
    85                                  :REM*39
25Ø REM                                 :REM*136
255 JD=NOTPEEK(JY)AND15:REM*241
26Ø IFJD=1ORJD=2THENX=X-(JD=1)+
    (JD=2):IFX>ØANDX<=GNTHEN28Ø
                                        :REM*37
265 IFJD=4ORJD=8THENY=Y-(JD=4)+
    (JD=8):IFY>ØANDY<=GNTHEN28Ø
                                        :REM*174
27Ø X=OX:Y=OY:GOTO23Ø                   :REM*94
275 REM                                 :REM*163
28Ø M=M+1:REM INCREASE # OF MOV
    ES                                  :REM*218
285 REM                                 :REM*173 ►
```

RUN it right: **C-64; joystick**

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ALPHABET SHUFFLE

```
300 TX=X:TY=Y:A$=" ":GOSUB170:R
    EM SWAP NEW SQUARE WITH OLD
     SQUARE              :REM*161
305 TX=OX:TY=OY:A$=PG$(X,Y):GOS
    UB170                :REM*252
310 PG$(OX,OY)=PG$(X,Y):PG$(X,Y
    )=" "                 :REM*8
315 REM                   :REM*203
330 C=GN*GN:REM CHECK FOR WINNE
    R                     :REM*104
335 FORI=1TOGN            :REM*48
340 : FORJ=1TOGN          :REM*107
345 :{3 SPACEs}IFPG$(I,J)=CG$(I
    ,J)THENC=C-1          :REM*100
350 : NEXT                :REM*158
355 NEXT:IFCTHEN220       :REM*95
365 REM                   :REM*253
380 PRINT"{CTRL 2}{SHFT CLR}{7
    CRSR DNs}{4 CRSR RTs}CONGRA
    TULATIONS....YOU'VE DONE IT
    ":GOTO390:REM END PRG
                          :REM*34
385 PRINT"{CTRL 2}{SHFT CLR}{7
    CRSR DNs}{9 CRSR RTs}GIVING
     UP......TSK, TSK" :REM*249
390 PRINT"{3 CRSR DNs}{2 SPACEs
    }THE CURRENT GAME TIME IS..
    ..: ";                :REM*26
395 PRINT"{CTRL 8}";MID$(TI$,3,
    2);":";RIGHT$(TI$,2):REM*95
400 PRINT"{CTRL 2}{2 CRSR DNs}{
    2 SPACEs}THE CURRENT # OF M
    OVES IS...:{CTRL 8}";M
                          :REM*31
405 REM                   :REM*38
410 FORI=1TO500:NEXT:REM SMALL
    DELAY                 :REM*188
415 GOSUB135:REM WAIT FOR FIRE
    BUTTON                :REM*201
420 GOTO480:REM GOTO SETUP
                          :REM*116
425 REM                   :REM*58
445 REM                   :REM*78
450 DIM CG$(5,5),PG$(5,5):REM I
    NITIALIZE             :REM*152
455 JY=56320:REM FOR JOYSTICK #
    1 CHANGE 56320 TO 56321
                          :REM*80
460 DN$="{HOME}{25 CRSR DNs}"
                          :REM*237
465 REM                   :REM*98
480 POKE53280,0:POKE53281,0:REM
     TITLE SCREEN         :REM*128
485 PRINT"{SHFT CLR}{4 CRSR DNs
    }{CTRL 2}{10 SPACEs}THE ALP
    HABET SHUFFLE"        :REM*2
490 PRINT"{CTRL 8}{9 SPACEs}{22
     COMD Ys}{CTRL 2}     :REM*156
495 PRINT"{2 CRSR DNs}{2 SPACEs
    }1) {CTRL 8}BEGINNER GAME..
    ..... {CTRL 2}3 BY 3 GRID
                          :REM*0
500 PRINT"{2 CRSR DNs}{2 SPACEs
    }2) {CTRL 8}INTERMEDIATE GA
    ME.... {CTRL 2}4 BY 4 GRID
                          :REM*137
505 PRINT"{2 CRSR DNs}{2 SPACEs
    }3) {CTRL 8}EXPERT GAME....
    ..... {CTRL 2}5 BY 5 GRID
                          :REM*125
510 PRINT"{3 CRSR DNs} MOVE JOY
    STICK (UP/DOWN) TO SELECT G
    AME                   :REM*244
515 PRINT"{CRSR DN}{7 SPACEs}PR
    ESS FIRE BUTTON TO ENTER
                          :REM*106
520 GN=3:GOSUB600:REM SELECT GA
    ME W/JOYSTICK         :REM*39
525 REM                   :REM*158
540 IF(PEEK(JY)AND16)/16=0THEN6
    50                    :REM*102
545 JD=NOTPEEK(JY)AND15 :REM*17
550 IFJD<>1ANDJD<>2THEN540
                          :REM*100
555 GOSUB580:GOTO540      :REM*168
575 REM                   :REM*204
580 PRINT"{CTRL 1}";:GOSUB610
                          :REM*17
585 GN=GN+(JD=1)-(JD=2) :REM*63
590 IFGN<3THENGN=5        :REM*163
595 IFGN>5THENGN=3        :REM*182
600 PRINT"{CTRL 8}";      :REM*184
605 REM                   :REM*238
610 PRINTLEFT$(DN$,5+(GN-2)*3);
                          :REM*248
615 PRINT" {SHFT U}{36 SHFT *s}
    {SHFT I}              :REM*47
620 PRINT" {SHFT -}{36 CRSR RTs
    }{SHFT -}             :REM*194
625 PRINT" {SHFT J}{36 SHFT *s}
    {SHFT K}              :REM*95
630 RETURN                :REM*7
635 REM                   :REM*9
650 PRINT"{SHFT CLR}{2 CRSR DNs
    }{CTRL 2}{3 SPACEs}INSTRUCT
    IONS FOR ALPHABET SHUFFLE":
    REM INSTRUCTION SCREEN
                          :REM*84
655 PRINT"{CTRL 8}{2 SPACEs}{35
     COMD Ys}{CTRL 2}     :REM*224
660 PRINT"{CRSR DN}{4 SPACEs}TH
    E OBJECT OF THIS GAME IS QU
    ITE                   :REM*69
665 PRINT"{CRSR DN}{3 SPACEs}SI
    MPLE. JUST REARRANGE THE LE
    TTERS                 :REM*246
670 PRINT"{CRSR DN}{8 SPACEs}IN
    TO {CTRL 8}ALPHABETICAL ORD
    ER.{CTRL 2}           :REM*92
675 PRINT"{13 SPACEs}{18 COMD T
    s}                    :REM*193
680 PRINT"{CRSR DN}{4 SPACEs}WH
    EN THE GAME IS COMPLETED EA
    CH                    :REM*230
685 PRINT"{CRSR DN}{6 SPACEs}RO
    W WILL BE THE SAME COLOR.
                          :REM*197
690 PRINT"{2 CRSR DNs}{5 SPACEs
    }TO QUIT PLAYING AND TRY AG
    AIN                   :REM*250
695 PRINT"{CRSR DN}{9 SPACEs}PR
    ESS THE FIRE BUTTON:REM*117
700 PRINT"{2 CRSR DNs}{CTRL 8}{
    7 SPACEs}PLEASE WAIT.....SE
    TTING UP{HOME}        :REM*86
705 REM                   :REM*83
720 FORI=1TOGN:REM SETUP WINNIN
    G GRID                :REM*111
725 : FORJ=1TOGN          :REM*245
730 :{3 SPACEs}CG$(I,J)=CHR$(65
    +(I-1)*GN+(J-1))      :REM*144
735 :{3 SPACEs}PG$(I,J)=" "
                          :REM*45
740 : NEXT                :REM*38
745 NEXT:CG$(GN,GN)=" " :REM*99
755 REM                   :REM*129
770 FORI=65TO63+GN*GN:REM SETUP
     PLAYING GRID         :REM*169
775 : X=INT(RND(1)*(GN-1)+1.5)
                          :REM*10
780 : Y=INT(RND(1)*(GN-1)+1.5)
                          :REM*13
785 : IFX*Y=GN*GNTHEN775
                          :REM*100
790 : IFPG$(X,Y)<>" "THEN775
                          :REM*201
795 : PG$(X,Y)=CHR$(I)    :REM*215
800 NEXT                  :REM*161
820 GOSUB135:REM WAIT FOR FIRE
    BUTTON                :REM*102
825 REM                   :REM*203
830 HP=((38-GN*4)/2):VP=((26-GN
    *4)/2)                :REM*255
840 REM                   :REM*212
845 PRINT"{SHFT CLR}{CTRL 8}";L
    EFT$(DN$,VP);:REM PRINT FIN
    ISHED GRID            :REM*119
850 PRINTSPC(HP);"{COMD A}";RIG
    HT$("{3 SHFT *s}{COMD R}{3
    SHFT *s}{COMD R}{3 SHFT *s}
    {COMD R}{3 SHFT *s}{COMD R}
    {3 SHFT *s}{COMD S}",4*GN)
                          :REM*151
855 FORI=1TOGN            :REM*74
860 : FORJ=1TO3           :REM*126
865 :{3 SPACEs}PRINTSPC(HP);"{S
    HFT -}";RIGHT$("{3 SPACEs}{
    SHFT -}{3 SPACEs}{SHFT -}{3
     SPACEs}{SHFT -}{3 SPACEs}{
    SHFT -}{3 SPACEs}{SHFT -}",
    4*GN)                 :REM*190
870 : NEXT                :REM*160
875 : PRINTSPC(HP);"{COMD Q}";R
    IGHT$("{3 SHFT *s}{SHFT +}{
    3 SHFT *s}{SHFT +}{3 SHFT *
    s}{SHFT +}{3 SHFT *s}{SHFT
    +}{3 SHFT *s}{COMD W}",4*GN
    )                     :REM*67
880 NEXT                  :REM*241
885 PRINT"{CRSR UP}";SPC(HP);"{
    COMD Z}";RIGHT$("{3 SHFT *s
    }{COMD E}{3 SHFT *s}{COMD E
    }{3 SHFT *s}{COMD E}{3 SHFT
     *s}{COMD E}{3 SHFT *s}{COM
    D X}",4*GN)           :REM*196
890 REM                   :REM*13
905 FORTX=1TOGN:REM PRINT GRID
    LETTERS               :REM*160
910 : FORTY=1TOGN         :REM*41
915 :{3 SPACEs}A$=PG$(TX,TY)
                          :REM*235
920 :{3 SPACEs}GOSUB170 :REM*76
925 : NEXT                :REM*223
930 NEXT                  :REM*32
935 REM                   :REM*50
940 GOTO210:REM GOTO MAIN LOOP
                          :REM*69 ■
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Alien Strike

Defend yourself against wave after wave of alien creatures in this fast-paced shoot-'em-up.

By BEHZAD JAMSHIDI

Watch out! What was that? Find out when you play this one-person action game, designed for the C-64 with a joystick plugged into port 2.

Here's the scenario that unfolds when you press F1 to play. An alien space ship wanders back and forth across the top of the screen, launching squadrons of fighters that try to destroy your only line of defense, a cannon at the bottom of the screen. The fighters come in numerous shapes and sizes, and they travel at various speeds on unpredictable paths. Are you fast enough to shoot them down, along with the mother ship, without getting zapped yourself?

We'll see. Using the joystick, move the cannon back and forth to avoid the attackers and to aim; then press the firebutton to shoot. Hold the firebutton down for rapid fire.

If you destroy the mother ship, a new one unfortunately appears and sends out an additional squadron of fighters. There's a third mother ship, too, and four squadrons altogether.

You get 20 points for each fighter you destroy. Mother ships are worth 120.

The Unexpected consists of three programs. Listing 1 is the boot program, Listing 2 is the game itself and Listing 3 is the sprite data. Type them all in, using *RUN*'s Checksum program to detect typing errors, and save them to disk. Load and run Listings 2 and 3 to create the ML files on disk. To play, load the boot program and press F1. R

Behzad Jamshidi is a graphics design student with a natural interest in computer graphics.

Running Instructions: **Type in all three listings, save them to disk, and then load and run Listings 2 and 3 to create the machine language files. To play, load Listing 1, the boot program, and press F1.**

Listing 1. Boot program. (Available on ReRun disk. See order card facing page 24.)

```
5 ONAGOSUB2Ø,3Ø          :REM*1Ø8
1Ø A=1:LOAD"SPRITES",8,1          :REM*153
2Ø A=2:LOAD"THE UNEXPECTED",8,1          :REM*89
3Ø A=3:SYS49152          :REM*116
```

Listing 2. The Unexpected creator program. (Available on ReRun disk. See order card facing page 24.)

```
Ø REM THIS LIST 2 CREATES (AND
  SHOULD NOT BE CALLED) THE UNE
  XPECTED                  :REM*72
5 OPEN 8,8,8,"THE UNEXPECTED,P,
  W"                       :REM*195
6 CT=Ø:PRINT"{SHFT CLR)":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
   E8:PRINT:PRINT"ALL DONE!":EN
   D                       :REM*129
12 PRINT"{HOME}READING LINE "+S
   TR$(CT):CT=CT+1         :REM*141
15 IF LEN(A$)<62 THEN 55
                           :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
   2Ø)+MID$(A$,43,2Ø)      :REM*242
25 FOR I=1 TO 3Ø           :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                           :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55               :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55               :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                           :REM*67
5Ø NEXT:GOTO 1Ø            :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
   O 7Ø                    :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
   A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
   )):GOTO 7Ø              :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
   Ø)+RIGHT$(A$,LEN(A$)-42)
                           :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                           :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55               :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55               :REM*84 ►
```

RUN it right: **C-64; joystick**

ILLUSTRATED BY KEVIN HAWKES

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ALIEN STRIKE

```
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*148
95 NEXT:GOTO 1Ø           :REM*16Ø
1ØØ REM UNEXPECTED ML     :REM*35
1Ø1 DATA ØØCØA9932ØD2FFA9ØØ8D*F
    3ØBA9D28DBDØBA98Ø8D*F8Ø7A98
    18DF9Ø7A9758D         :REM*1Ø4
1Ø2 DATA EØØ78DB8Ø78D9ØØ78D68*Ø
    78D4ØØ78D18Ø78DFØØ6*8DC8Ø68
    DAØØ68D78Ø68D         :REM*99
1Ø3 DATA 5ØØ68D28Ø68DØØØ68DD8*Ø
    58DBØØ58D88Ø58D6ØØ5*8D38Ø58
    D1ØØ58DE8Ø48D         :REM*69
1Ø4 DATA CØØ48D98Ø48D7ØØ48D48*Ø
    48D2ØØ4A9ØØ8DEEØB8D*BFØB8D2
    ØDØ8DECØB8D21         :REM*23
1Ø5 DATA DØ8DF2ØB8DE3ØBA9FF8D*B
    9ØB8D1CDØ8DØEDØA986*8DFFØ7A
    9ØA8D2EDØA9ØB         :REM*171
1Ø6 DATA 8D26DØA9ØF8D18D4A95Ø*8
    DØ5D4A9ØF8D18D4A91Ø*8DØ5D4A
    9F Ø8DØ6D4A9F3        :REM*181
1Ø7 DATA 8DØ6D4A9Ø78DØ3D4A9Ø1*8
    DBBØB8D27DØA9Ø28D28*DØA9828
    DØØDØ8DB8ØB8D         :REM*173
1Ø8 DATA EØØB8DE1ØB8DE2ØB8DE3*Ø
    B8DE4ØB8DFAØ78DFBØ7*8DFCØ78
    DFDØ78DFEØ7A9         :REM*131
1Ø9 DATA 338DE6ØB8DØFDØA9Ø48D*B
    AØBA93Ø8D15Ø4A9FF8D*Ø1DØA96
    48DBEØBA9ØØ8D         :REM*158
11Ø DATA CØØB8DC2ØB8DC4ØB8DC6*Ø
    B8DC8ØB8DØ4DØ8DØ6DØ*8DCFØB8
    DDØØB8DD1ØB8D         :REM*1Ø4
111 DATA D2ØB8DD3ØB8DØ8DØ8DØA*D
    Ø8DØCDØA94C8DC1ØB8D*Ø5DØA96
    58DC3ØB8DØ7DØ         :REM*23
112 DATA A97E8DC5ØB8DØ9DØA997*8
    DC7ØB8DØBDØA9BØ8DC9*ØB8DØDD
    ØA9FF8DCAØB8D         :REM*197
113 DATA CBØB8DCCØB8DCDØB8DCE*Ø
    BA9Ø28DE8ØB8DE9ØB8D*29DØ8D2
    ADØ8D2BDØ8D2C         :REM*91
114 DATA DØ8D2DDØA9138D1ØØ4A9*Ø
    88D11Ø4A9Ø98D12Ø4A9*1Ø8D13Ø
    4A92Ø8D14Ø4A9         :REM*194
115 DATA 138DØØØ4A9Ø38DØ1Ø48D*F
    1ØBA9ØF8DØ2Ø4A9128D*Ø3Ø4A9F
    D8D15DØA9Ø58D         :REM*35
116 DATA Ø4Ø42ØC8C14C27C2A91Ø*8
    DC3Ø5A9128DC4Ø5A9Ø5*8DC5Ø5A
    9138DC6Ø58DC7         :REM*116
117 DATA Ø5A9Ø68DC9Ø5A9318DCA*Ø
    5A92Ø8DC8Ø5AØFD8C15*DØA6C5E
    ØØ4DØF58DC3Ø5         :REM*192
118 DATA 8DC4Ø58DC5Ø58DC6Ø58D*C
    7Ø58DC8Ø58DC9Ø58DCA*Ø5A9338
    D15Ø42ØC2C86Ø         :REM*48
119 DATA AEF2ØBEØØ1DØØ62ØC8C1*4
    CØØCØAEØØDCEØ77DØ11*AEB8ØBE
    ØFFFØ16E88EB8         :REM*57
12Ø DATA ØB8EØØDØ4C4BC2EØ67DØ*Ø
    8A9Ø18DBBØB4C2EC2AE*ØØDCEØ7
    BDØ11AEB8ØBEØ         :REM*147
121 DATA 19FØ16CA8EB8ØB8EØØDØ*4
    C6FC2EØ6BDØØ8A9Ø18D*BBØB4C5
    2C2AEB9ØBCA8E         :REM*236
122 DATA B9ØBEØØØDØF5AEBAØBCA*8
    EBAØBEØØØDØØ34C9ØC2*A6FF8EB
    7ADE8ØB8D2BDØ         :REM*74
14Ø DATA AED7ØBEØØ1DØ3ØAEC7ØB*E
    88EC7ØB8EØBDØEØFADØ*22A9ØØ8
    DC6ØB8DØADØ8D         :REM*246
141 DATA D2ØB8DD7ØBA9978DC7ØB*8
    DØBDØADEØØB8DFDØ7AD*E8ØB8D2
    CDØAED8ØBEØØ1         :REM*61
142 DATA DØ3ØAEC9ØBE88EC9ØB8E*Ø
    DDØEØFADØ22A9ØØ8DC8*ØB8DØCD
    Ø8DD3ØB8DD8ØB         :REM*169
143 DATA A9BØ8DC9ØB8DØDDØADEØ*Ø
    B8DFEØ7ADE8ØB8D2DDØ*2ØØ4C54
    C37C6AE1EDØ8E         :REM*12
144 DATA D9ØBA9Ø22DD9ØBC9Ø2DØ*Ø
    62Ø19C62Ø16C8A98Ø2D*D9ØBC98
    ØDØ112ØD4C6A9         :REM*53
145 DATA Ø18DE5ØB8DE7ØB8DFØØB*2
    Ø6FC8A2Ø6ECD9ØBDØ21*A9ØØ8DE
    AØB8DCØØB8DØ4         :REM*4
146 DATA DØA94C8DC1ØB8DØ5DØA9*Ø
    18DE7ØB8DD4ØB8DCFØB*8DEBØBA
    2ØAECD9ØBDØ21         :REM*15Ø
147 DATA A9ØØ8DEAØB8DC2ØB8DØ6*D
    ØA9658DC3ØB8DØ7DØA9*Ø18DE7Ø
    B8DD5ØB8DDØØB         :REM*177
148 DATA 8DEBØBA212ECD9ØBDØ21*A
    9ØØ8DEAØB8DC4ØB8DØ8*DØA97E8
    DC5ØB8DØ9DØA9         :REM*136
149 DATA Ø18DE7ØB8DD6ØB8DD1ØB*8
    DEBØBA222ECD9ØBDØ21*A9ØØ8DE
    AØB8DC6ØB8DØA         :REM*76
15Ø DATA DØA9978DC7ØB8DØBDØA9*Ø
    18DE7ØB8DD7ØB8DD2ØB*8DEBØBA
    242ECD9ØBDØ21         :REM*153
151 DATA A9ØØ8DEAØB8DC8ØB8DØC*D
    ØA9BØ8DC9ØB8DØDDØA9*Ø18DE7Ø
    B8DD8ØB8DD3ØB         :REM*1Ø2
152 DATA 8DEBØBA9Ø12DD9ØBC9Ø1*D
    Ø14AEF3ØBEØØ1DØØ5AØ*Ø18CEFØ
    BA9Ø18DF3ØB8D         :REM*32
153 DATA EDØB6ØA9ØØ8DØ1D48DBF*Ø
    B8DBCØB8DBBØBA9E68D*BDØBA9F
    D8D15DØA9648D         :REM*5
154 DATA BEØB6ØAEECØBE88EECØB*E
    ØØ2FØØ34C93C6A2ØØ8E*ECØBAED
    DØBEØØ1DØØ34C         :REM*117
155 DATA 93C6AEDFØBEØØ1FØ1CA4*A
    28CDEØBAEDCØBE88EDC*ØB8EØED
    ØECDEØBFØØ34C         :REM*78
156 DATA 93C6A9Ø18DDFØBA4A28C*D
    EØBAEDCØBCA8EDCØB8E*ØEDØECD
    EØBFØØ34C93C6         :REM*129
157 DATA A9ØØ8DDFØBAEE5ØBEØØ1*F
    ØØ34CECC6AEE6ØBCA8E*2EDØ8EØ
    FDØ8EE6ØBEØØA         :REM*126
158 DATA FØØ34CECC6A9ØA8D2EDØ*A
    9ØØ8DE5ØB8DDDØB8DDF*ØBA9ØØ8
    DØEDØ8DDCØBA9         :REM*134
159 DATA 338DE6ØB8DØFDØ4CECC6*A
    EE9ØBE88EE9ØB8EE8ØB*EØØ8FØØ
    16ØA9Ø18DE9ØB         :REM*14
16Ø DATA 8DE8ØB6ØAEEAØBEØØ1DØ*1
    8AEEBØBE88EEBØBEØ1E*DØØAA9Ø
    Ø8DEAØBA98Ø8D         :REM*186
161 DATA 12D44C38C7AEE7ØBEØØ1*F
    ØØ34C38C7A9AØ8D13D4*A9FC8D1
    4D4A95Ø8DØFD4         :REM*23
162 DATA A9288DØED4A9818D12D4*A
    9Ø18DEAØBA9ØØ8DE7ØB*AEEFØBE
```

Get ready to stem the tide of alien attackers.

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```
    ØØ1FØØ34C45C7       :REM*211
163 DATA 2Ø6AC7AEFØØBEØØ1FØØ3*4
    C1AC2A9ØØ8DFØØBAEEØ*ØBE88EE
    ØØBEØ86FØØ34C       :REM*55
164 DATA 1AC2A9828DEØØB4C1AC2*A
    EEEØBE88EEEØBEØ5ØDØ*ØFA9ØØ8
    D2ØDØ8DEEØB8D       :REM*32
165 DATA EFØB2Ø8AC76ØA6A28E2Ø*D
    Ø6ØAEF1ØBCA8EF1ØB4C*A5C7A9Ø
    48DF1ØBA9ØØ8D       :REM*4
166 DATA EAØB8DBBØB8DBCØB6ØEØ*Ø
    2DØØ5A9328D15Ø4EØØ1*DØØ5A93
    18D15Ø4EØØØDØ       :REM*84
167 DATA 15A93Ø8D15Ø4A9Ø18DF2*Ø
    B2Ø15C3A98Ø8D12D44C*94C7EØØ
    3DØØ5A9338D15       :REM*116
168 DATA Ø46ØFBØ4FBØ4FBØ4FBØ4*F
    BØØFBØØFBØØFBØ4FBØØ*FBØ4FBØ
    4FBØ4FBØ4FBØ4       :REM*9
169 DATA FBØ4FBØØFBØ4FBØ4FBØØ*8
    7Ø4FFØ2Ø4ØØFFØØFFØØ*FFØØFFØ
    ØFF84FFØØFFØØ       :REM*61
17Ø DATA FFØØ4C1CC84C74A4ADA8*Ø
    2AEA9Ø2186914A88A69*ØØAA988
    DA8Ø28EA9Ø2A9       :REM*175
171 DATA D6A2ØØ85228623A9ØØA2*Ø
    ØAØØØ9122A9ØD2ØD2FF*A9D3A2Ø
    Ø85228623A9ØØ       :REM*188
172 DATA A2ØØAØØØ9122A91D2ØD2*F
    FADA8Ø2AEA9Ø28622AA*A5222ØC
    DBDA9ØD2ØD2FF       :REM*241
173 DATA 6ØADA8Ø2AEA9Ø2186964*A
    88A69ØØAA988DA8Ø28E*A9Ø2A9D
    6A2ØØ85228623       :REM*9
174 DATA A9ØØA2ØØAØØØ9122A9ØD*2
    ØD2FFA9D3A2ØØ852286*23A9ØØA
    2ØØAØØØ9122A9       :REM*1
175 DATA 1D2ØD2FFADA8Ø2AEA9Ø2*8
    622AAA5222ØCDBDA9ØD*2ØD2FF6
    ØA9ØØA2ØØ8DA8       :REM*48
176 DATA Ø28EA9Ø26ØØØ   :REM*134
177 DATA -1             :REM*35
```

Listing 3. The Sprite-Data program. (Available on ReRun disk. See order card facing page 24.)

```
Ø REM THIS LIST 3 CREATES (AND
  SHOULD NOT BE CALLED) SPRITES
                        :REM*245
5 OPEN 8,8,8,"SPRITES,P,W"
                        :REM*36
6 CT=Ø:PRINT"{SHFT CLR)":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:PRINT:PRINT"ALL DONE!":EN
  D                     :REM*129
12 PRINT"{HOME}READING LINE "+S
  TR$(CT):CT=CT+1       :REM*141
15 IF LEN(A$)<62 THEN 55
                        :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)    :REM*242
25 FOR I=1 TO 3Ø        :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55             :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55             :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*67
5Ø NEXT:GOTO 1Ø         :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 7Ø                  :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
  A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 7Ø            :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
  Ø)+RIGHT$(A$,LEN(A$)-42)
                        :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55             :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55             :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*148
95 NEXT:GOTO 1Ø         :REM*16Ø
1ØØ REM SPRITE DATA     :REM*134
1Ø1 DATA ØØ2ØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØ2ØØØØØ       :REM*215
1Ø2 DATA A8ØØØØA8ØØØØA8ØØØØA8*Ø
    ØØ2AAØØØ2AAØØØ2AAØØ*22AA2Ø2
    2BA2Ø3FBBFØFF       :REM*177
1Ø3 DATA BBFCFFBBFCØØØØ2ØØØØØ*2
    ØØØØØ2ØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*18Ø
1Ø4 DATA ØØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*76
1Ø5 DATA ØØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØ3BØØØØA28ØØØ*F3CØØ2A
    2AØØ2A2AØØ3F3       :REM*211
1Ø6 DATA FØØAA2A8ØA8ØA8ØFØØ3C*Ø
    A8ØA8ØAA2A8ØAA2A8Ø3*F3FØØ2A
    2AØØ2A2AØØØF3       :REM*144
1Ø7 DATA CØØØA28ØØØ2AØØØØØØØ*Ø
    ØØØØØØØØ2AØØØØ2EØØ*ØØ2EØØØ
    Ø2EØØØØ2EØØØØ       :REM*235
1Ø8 DATA 2EØØØØ2EØØØØ2EØØØØ2A*Ø
    ØØØØ8ØØØØ8ØØØØ8ØØ*ØØ2AØØØ
    Ø2EØØØØ2EØØØØ       :REM*1Ø5
1Ø9 DATA 2EØØØØ2EØØØØ2EØØØØ2E*Ø
    ØØØ2EØØØØ2AØØF9ØØØØ*ØØ2AØØA
    8AA82AAAA82AA       :REM*199
11Ø DATA AA82AAA8822A2AØØA8ØC*Ø
    Ø3ØØCØØ3ØØCØØ3ØØCØØ*3ØØCØØ3
    ØØCØØ3Ø2AØØA8       :REM*31
111 DATA AA82AAAA82AAAA822AA8*8
    2AA2AØØA8ØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØØ       :REM*171
112 DATA ØØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØ*AAØØØØ2
    8ØØØØ28ØØØØAA       :REM*44
113 DATA ØØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØF9AAAAAABB       :REM*117
114 DATA EBEEBBEBEEAAAAAAØØØØ*Ø
    ØØAAAAØØAFFAØØAAAAØ*ØØØØØØØ
    Ø28ØØØØ28ØØØØ       :REM*2Ø1
115 DATA ØØØØØAAAAØØAFFAØØAAA*A
    ØØØØØØØAAAAAABBEBEE*BBEBEEA
    AAAAAØØØØØØAA       :REM*179
116 DATA -1             :REM*229 ■
```


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Basic Dater

Now you can quickly identify the latest versions of your Basic program listings.

By KEN HUEBNER

If you're a C-64 or 128 programmer who has trouble keeping track of your Basic file listings, here's a handy utility that automatically signs the filename, date and time to every program you save. With Basic Dater, you'll no longer have to suffer the aggravation of getting your latest updated files confused with old backup versions.

Preparation

Type in Listing 1 or 2, whichever is appropriate for your computer. The C-64 and C-128 versions work exactly alike, but I had to write separate listings because Basic 2.0's operating internals are very different from those of Basic 7.0. Just be sure to save your copied listing and at least one backup onto disk. For the C-128 version, you must also type in Listing 3, save it to the same disk with the filename "DATER128.BAS" and then run it to create on the disk a machine language file named "DATER128.O".

Setting Date and Time

When you're ready to use Basic Dater, load and run Listing 1 for the C-64 or Listing 2 for the C-128. With the C-64, expect a short delay while the ML code is poked into RAM. Once your computer is ready, a prompt will appear, asking for the date. Answer by typing, in compressed form, the month, day and year, separated by dashes (e.g., 2-31-1989). The program then asks you, "What's the time?" Type in the time in hours and minutes, plus whether it's AM or PM, without any intervening spaces or special characters. For example, if it's 5:35 PM, type 535PM.

Once the utility has accepted your entered time, the message "Dispatcher On" appears. [Dispatcher was the original program name, generated here by the ML code.—Eds.] If you wish to turn Basic Dater off, enter SYS 52224 for the C-64 or SYS 6144 for the C-128. In case you forget the turn-off instructions, press the run-stop/restore key combination simultaneously.

Important Considerations

Always load and run Basic Dater before you begin a programming session. Note that the second program line will now be unavailable for your use, since Basic Dater uses this line to record program information. Just place a REM or colon at line 2 to properly format your program. Whenever you're ready to save your Basic file, simply do it as you normally would.

When you load the file again, you'll see that the second line now contains the filename in parentheses, followed by the date and time that the save occurred. Now, each time you save a file, a little record of the save is made in the Basic listing. There's also no need to worry about sharing a signed program ►

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with a friend, since a program signed by Basic Dater is fully compatible with Commodore's Basic, whether or not the Dater program is in memory.

Finally, if you're doing some program debugging, don't be hesitant about pressing the run-stop/restore keys as an escape, for this will not disable either version of Basic Dater. R

Ken Huebner, a software designer who runs his own business, Softrek, has had several articles published in RUN, *most recently "Deep C-64 World," in last November's issue.*

DATER 64/128
40 REM HERE'S A SAMPLE PROGRAM
50 REM BY SOFTAG WITH A SECOND LINE THAT
CONSISTS OF A REM STATEMENT. THE
40 REM DATE AND TIME ARE AUTOMATICALLY
ADDED TO THE PROGRAM.

Basic Dater's labeling of your listings with date and time will save you time any old day.

Listing 1. Basic Dater C-64 program. (Available on ReRun disk. See order card facing page 24.)

```
10 REM DATER 64 BY KEN HUEBNER
                          :REM*86
20 UI=52224               :REM*0
30 UT=UI+3+2:REM MIN,HOUR,AM
                          :REM*103
40 UD=UT+3:UM=UD+1:UY=UD+2:REM
   DAY,MONTH,YEAR         :REM*40
50 PRINT"PLEASE WAIT..."
                          :REM*247
60 Y=UI:READ A$           :REM*68
70 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,20)     :REM*196
80 FOR X=1 TO 59 STEP 2:REM*119
90 C$=MID$(B$,X,2):H$=LEFT$(C$,
   1):L$=RIGHT$(C$,1)     :REM*218
100 H=VAL(H$):IFH$>"9"THEN H=AS
   C(H$)-55               :REM*20
110 L=VAL(L$):IFL$>"9"THEN L=AS
   C(L$)-55               :REM*61
120 POKEY,H*16+L          :REM*76
130 Y=Y+1:NEXTX:READA$    :REM*70
140 IFA$<>""THEN 70       :REM*20
150 PRINT"{SHFT CLR}{3 CRSR DNs
   }"                     :REM*28
160 PRINT TAB(10)"DATER 64"
                          :REM*148
170 PRINT                 :REM*66
180 PRINT"ENTER THE DATE"
                          :REM*245
190 INPUT "(FORMAT:4-10-1990)";
   DD$                    :REM*57
200 X=0:Z=0               :REM*49
210 X=X+1:IFX>LEN(DD$)THEN 240
                          :REM*150
220 A$=MID$(DD$,X,1)      :REM*87
230 IF A$<>"-"THEN D$=D$+A$:GOT
   O210                   :REM*10
240 IFZ=0 THEN M=VAL(D$)
                          :REM*184
250 IFZ=1 THEN D=VAL(D$):REM*96
260 IFZ=2 THEN Y=VAL(D$):REM*21
270 D$="":Z=Z+1:IFZ<3 THEN210
                          :REM*199
280 IF D<1 OR D>31 THEN 180
                          :REM*246
290 IF Y<1989 OR Y>1999 THEN 18
   0                      :REM*73
300 IF M<1 OR M>12 THEN 180
                          :REM*30
310 POKE UD,D-1:POKE UM,M-1:POK
   E UY,Y-1900            :REM*253
320 PRINT:PRINT"ENTER THE TIME"
                          :REM*171
330 INPUT "(FORMAT: 930AM)";T$
                          :REM*108
340 IF LEN(T$)=5 THEN T$="0"+T$
                          :REM*69
350 IF LEN(T$)<>6 THEN 320
                          :REM*147
360 A$=RIGHT$(T$,2)       :REM*172
370 MI$=MID$(T$,3,2)      :REM*185
380 HR$=MID$(T$,1,2)      :REM*166
390 MI=VAL(MI$):H=VAL(HR$):A=0
                          :REM*7
400 IF A$="PM" THEN A=1:REM*252
410 IF MI<0 OR MI>59 THEN 320
                          :REM*164
420 IF H<1 OR H>12 THEN 320
                          :REM*124
430 IF H=12 THEN H=0      :REM*172
440 POKE UT,MI:POKE UT+1,H:POKE
    UT+2,A                :REM*6
450 PRINT:SYS UI:PRINT    :REM*249
460 NEW                   :REM*108
470 DATA 4C2ACC00000000000000 5
    813000000000000000 0000000
    0000000000000      :REM*176
480 DATA 0000FFCC0000510D0000 E
    9CC0878A50148A93785 01AC23C
    CD017A201BD32         :REM*48
490 DATA 039D22CCBD000039D26CC B
    D14039D1ECCCA10EBAD 11CC490
    2D00209808D11         :REM*140
500 DATA CC208CCC6885012860048 8
    A489848A000BAFE04001 D003FE0
    501BD04018 5FC        :REM*71
510 DATA BD0501 85FDB1FCF00520 D
    2FF90E468A868AA6860 0878206
    3CC4449535041         :REM*158
520 DATA 5443482000AD11CCC902 F
    00B2063CC4F4646 00A2 0010202
    063CC4F4E0D54         :REM*76
530 DATA 4F204F46462C20454E54 4
    5522053595320353232 3234 00A
    202A000BD26CC         :REM*107
540 DATA 9900 03BD22CC9932 03BD 1
    ECC9914 03E8C8C00290 E8286 04
    88A489848A591         :REM*133
550 DATA C97FD00320 8CCC68A868 A
    A686C26CCA5A2CD10CC 8D10CCF
    03 0A21CAD0ACC        :REM*88
560 DATA 2903D002A21D8E46CDAE 0
    9CCBD45CD8D41CDA2 00 BD03CC1
    8690 1DD3CCD90        :REM*51
570 DATA 02A900 9D03CC900 5E8E0 0
    990E96C1ECC3C3C3C0C 021E0C6
    4181F1C1F1E1F         :REM*16
580 DATA 1E1F1F1E1F1E1F0878A5 9
    D100CAD11CCF00730005 2096CDB
    00EA62DA42E86         :REM*239
590 DATA AE84AFA92B286C22CC28 2
    063CC4449535041544 3 4820455
    2524F522D204E         :REM*216
600 DATA 4F2052454D2032 4E442 0 4
    C494E45006020A0CDB0 0420D9C
    D18602 0CDCEB0        :REM*126
610 DATA 30A004B1FAC93AF004C9 8
    FD024A52DA62E38E901 B001CA8
    5FA86FBA000B1         :REM*179
620 DATA FAA04091FAA5FACD12CC D
    0E7EC13CCD0E2186038 6041502
    0CDCEA90420 11        :REM*243
630 DATA CFA98F2007CF2005CFA4 B
    7F023A9222007CFA000 B1BBC8C
    93AF006C4B790         :REM*148
640 DATA F5A000B1BB2007CFC8C4 B
    790F6A9222007CF2005 CFAD09C
    C202DCFA92D20         :REM*232
650 DATA 07CFAD08CC202DCFA92D 2
    007CFAD0BCC2029CFAD 0ACC202
    9CF2005CFAD06         :REM*246
660 DATA CCD002A90C2030CFA93A 2
    007CFAD05CC2029CFA9 3A2007C
    FAD04CC2029CF         :REM*31
670 DATA 2005CFAE07CCBDD7CD20 0
    7CFA94D2007CFA9002 0 07CFAD1
    2CCAE13CC85FC         :REM*237
680 DATA 86FDA04 0B1FCA000 91FA E
    6FCD002E6FDE6FAD002 E6FBA5F
    CC52DA5FDE52E         :REM*94
690 DATA 90E2201BCF18A001B1FA F
    01DA004C8B1FAD0FBC8 9865FAA
    AA000 91FAA5FB        :REM*181
700 DATA 6900C891FA86FA85FB90 D
    DA891FA2024CF690285 2D9001E
    8862E60A52BA6         :REM*197
710 DATA 2C20DCCEB02DAD12CCAE 1
    3CC2001FCF8D16CC8E17 CCA003B
    1FA9912CC8810         :REM*170
720 DATA F838AD12CCED16CC8D18 C
```


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BASIC DATER

```
    CAD12CCØD13CCFØØ218 6Ø386ØA
    92Ø84FCAØØØ91       :REM*225
73Ø DATA FAA4FCA9Ø11865FA85FA 9
    ØØ2E6FB6ØA52BA62C85 FA86FB6
    ØA5FAA6FB6ØAØ       :REM*54
74Ø DATA Ø11ØØ5186ØØ1AØØØ84FC 2
    Ø48CFA6FCDØØ3AE1DCC BD1ACC2
    ØØ7CFCA1ØF76Ø       :REM*77
75Ø DATA A2FF38E8E964BØFB6964 8
    E1CCCA2FFE8E9ØABØFB 69ØA8E1
    BCC8D1ACCA2Ø2        :REM*4
76Ø DATA BD1ACCDØØ4CA1ØF8E88E 1
    DCCA2Ø218BD1ACC693Ø 9D1ACCC
    A1ØF46Ø41ØØØØ       :REM*153
77Ø DATA                 :REM*134
```

Listing 2. Basic Dater C-128 program. (Available on ReRun disk. See order card facing page 24.)

```
1Ø REM DATER 128 BY KEN HUEBNER
                        :REM*24Ø
2Ø UI=DEC("18ØØ")       :REM*227
3Ø UT=UI+3+2:REM MIN,HOUR,AM
                        :REM*1Ø3
4Ø UD=UT+3:UM=UD+1:UY=UD+2:REM
   DAY,MONTH,YEAR       :REM*4Ø
5Ø PRINT"{SHFT CLR}{3 CRSR DNs}
   "                    :REM*177
6Ø PRINT TAB(1Ø)"DATER 128"
                        :REM*38
7Ø PRINT                :REM*223
8Ø BLOAD "DATER128.O"   :REM*17Ø
9Ø PRINT"ENTER THE DATE":REM*95
1ØØ INPUT "(FORMAT: 4-1Ø-199Ø)"
   ;DD$                 :REM*63
11Ø X=Ø:Z=Ø             :REM*234
12Ø X=X+1:IFX>LEN(DD$)THEN 15Ø
                        :REM*113
13Ø A$=MID$(DD$,X,1)    :REM*24Ø
14Ø IF A$<>"-"THEN D$=D$+A$:GOT
   O12Ø                 :REM*166
15Ø IFZ=Ø THEN M=VAL(D$):REM*86
16Ø IFZ=1 THEN D=VAL(D$):REM*62
17Ø IFZ=2 THEN Y=VAL(D$)
                        :REM*178
18Ø D$="":Z=Z+1:IFZ<3 THEN12Ø
                        :REM*126
19Ø IF D<1 OR D>31 THEN 9Ø
                        :REM*1Ø
2ØØ IF Y<1989 OR Y>1999 THEN 9Ø
                        :REM*143
21Ø IF M<1 OR M>12 THEN 9Ø
                        :REM*113
22Ø POKE UD,D-1:POKE UM,M-1:POK
   E UY,Y-19ØØ          :REM*67
23Ø PRINT:PRINT"ENTER THE TIME"
                        :REM*13
24Ø INPUT "(FORMAT: 93ØAM)";T$
                        :REM*2Ø3
25Ø IF LEN(T$)=5 THEN T$="Ø"+T$
                        :REM*27
26Ø IF LEN(T$)<>6 THEN 23Ø
                        :REM*122
27Ø A$=RIGHT$(T$,2)     :REM*7Ø
28Ø MI$=MID$(T$,3,2)    :REM*67
29Ø HR$=MID$(T$,1,2)    :REM*64
3ØØ MI=VAL(MI$):H=VAL(HR$):A=Ø
                        :REM*168
31Ø IF A$="PM" THEN A=1:REM*154
32Ø IF MI<Ø OR MI>59 THEN 23Ø
                        :REM*31
33Ø IF H<1 OR H>12 THEN 23Ø
                        :REM*35
34Ø IF H=12 THEN H=Ø    :REM*118
35Ø POKE UT,MI:POKE UT+1,H:POKE
    UT+2,A              :REM*163
36Ø PRINT:SYS UI:PRINT  :REM*151
37Ø NEW                 :REM*22
```

Listing 3. Dater128.BAS, which creates the ML code named DATER128.O. (Available on ReRun disk. See order card facing page 24.)

```
1Ø REM LISTING 3 -- SAVE TO DIS
   K AS DATER128.BAS. RUN TO CR
   EATE "DATER128.O"    :REM*131
2Ø UI=DEC("18ØØ")       :REM*227
3Ø PRINT"PLEASE WAIT..."
                        :REM*227
4Ø Y=UI:READ A$         :REM*48
5Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
   2Ø)+MID$(A$,43,2Ø)   :REM*2Ø8
6Ø FOR X=1 TO 59 STEP 2 :REM*67
7Ø C$=MID$(B$,X,2):H$=LEFT$(C$,
   1):L$=RIGHT$(C$,1)   :REM*2Ø6
8Ø H=VAL(H$):IFH$>"9"THEN H=ASC
   (H$)-55              :REM*56
9Ø L=VAL(L$):IFL$>"9"THEN L=ASC
   (L$)-55              :REM*73
1ØØ POKEY,H*16+L        :REM*88
11Ø Y=Y+1:NEXTX:READA$  :REM*82
12Ø IFA$<>""THEN 5Ø     :REM*243
13Ø BSAVE "DATER128.O",BØ,P(UI)
   TO P(Y)              :REM*147
14Ø DATA 4C2A18ØØØØØØØØØØØØØØ 5
   813ØØØØØØØØØØØØØØØ ØØØØØØØ
   ØØØØØØØØØØØØØ       :REM*177
15Ø DATA ØØØØD818ØØØØ2A19ØØØØ C
   218Ø878ADØØFF48A9ØØ 8DØØFFA
   C2318DØ17A2Ø1        :REM*212
16Ø DATA BD32Ø39D2218BDØØØA9D 2
   618BD14Ø39D1E18CA1Ø EBAD111
   849Ø2DØØ2Ø98Ø        :REM*157
17Ø DATA 8D11182Ø6618688DØØFF 2
   86ØØ8782Ø7DFF444953 5Ø41544
   3482ØØØAD1118        :REM*226
18Ø DATA C9Ø2FØØB2Ø7DFF4F4646 Ø
   ØA2ØØ1Ø1F2Ø7DFF4F4E ØD544F2
   Ø4F46462C2Ø45        :REM*56
19Ø DATA 4E544552Ø5359532Ø36 3
   1343400A2Ø2AØØØBD26 1899ØØØ
   ABD221899323Ø3       :REM*19
2ØØ DATA BD1E18991403E8C8CØØ2 9
   ØE8286Ø488A489848A5 91C97FD
   ØØ32Ø661868A8        :REM*68
21Ø DATA 68AA686C2618A5A2CD1Ø 1
   88D1Ø18FØ3ØA21CADØA 182Ø93D
   ØØ2A21D8E1F19        :REM*53
22Ø DATA AEØ918BD1E198D1A19A2 Ø
   ØBDØ318186Ø91DD1519 9ØØ2A9Ø
   Ø9DØ3189ØØ5E8        :REM*244
23Ø DATA EØØ99ØE96C1E183C3C3C Ø
   CØ21EØC64181F1C1F1E 1F1E1F1
   F1E1F1E1FØ878        :REM*255
24Ø DATA A59D1ØØCAD1118FØØ73Ø Ø
   52Ø7119BØ1ØAE1Ø12AC 111286A
   E84AFA92D286C        :REM*253
25Ø DATA 221828207DFF4449535Ø 4
   1544348Ø4552524F52 2D2Ø4E4
   F2Ø52454D2Ø32        :REM*99
26Ø DATA 4E442Ø4C494E45ØØ6ØAD Ø
   ØFF48A93F8DØØFF2Ø88 19BØØ42
   ØC31918688DØØ        :REM*2
27Ø DATA FF6Ø2ØBB1ABØ32AØØ4B1 F
   AC93AFØØ4C98FDØ26AD 1Ø12AE1
   11238E9Ø1BØØ1        :REM*34
28Ø DATA CA85FA86FBAØØØB1FAAØ 4
   Ø91FAA5FACD1218DØE7 EC1318D
   ØE2186Ø386Ø41        :REM*221
29Ø DATA 5Ø2ØBB1AA9Ø42ØFF1AA9 8
   F2ØF51A2ØF31AA4B7FØ 23A9222
   ØF51AAØØØB1BB        :REM*17
3ØØ DATA C8C93AFØØ6C4B79ØF5AØ Ø
   ØB1BB2ØF51AC8C4B79Ø F6A9222
   ØF51A2ØF31AAD        :REM*125
31Ø DATA Ø9182Ø1B1BA92D2ØF51A A
   DØ8182Ø1B1BA92D2ØF5 1AADØB1
   82Ø171BADØA18        :REM*79
32Ø DATA 2Ø171B2ØF31AADØ618DØ Ø
   2A9ØC2Ø1E1BA93A2ØF5 1AADØ51
   82Ø171BA93A2Ø        :REM*248
33Ø DATA F51AADØ4182Ø171B2ØF3 1
   AAEØ718BDC1192ØF51A A94D2ØF
   51AA9ØØ2ØF51A        :REM*2Ø8
34Ø DATA AD1218AE131885FC86FD A
   Ø4ØB1FCAØØØ91FAE6FC DØØ2E6F
   DE6FADØØ2E6FB        :REM*139
35Ø DATA A5FCCD1Ø12A5FDED1112 9
   ØE2ØØ91B18AØØ1B1FA FØ1DAØØ
   4C8B1FADØFBC8        :REM*179
36Ø DATA 9865FAAAAØØØ91FAA5FB 6
   9ØØC891FA86FA85FB9Ø DDA891F
   A2Ø121B69Ø28D        :REM*172
37Ø DATA 1Ø129ØØ1E88E11126ØA5 2
   DA62E2ØCA1ABØ2DAD12 18AE131
   82ØØD1B8D1618        :REM*71
38Ø DATA 8E1718AØØ3B1FA991218 8
   81ØF838AD1218ED1618 8D1818A
   D1218ØD1318FØ        :REM*122
39Ø DATA Ø2186Ø386ØA92Ø84FCAØ Ø
   Ø91FAA4FCA9Ø11865FA 85FA9ØØ
   2E6FB6ØA52DA6        :REM*222
4ØØ DATA 2E85FA86FB6ØA5FAA6FB 6
   ØAØØ11ØØ5186Ø91AØØØ 84FC2Ø3
   61BA6FCDØØ3AE        :REM*18Ø
41Ø DATA 1D18BD1A182ØF51ACA1Ø F
   76ØA2FF38E8E964BØFB 69648E1
   C18A2FFE8E9ØA        :REM*251
42Ø DATA BØFB69ØA8E1B188D1A18 A
   2Ø2BD1A18DØØ4CA1ØF8 E88E1D1
   8A2Ø218BD1A18        :REM*172
43Ø DATA 693Ø9D1A18CA1ØF46Ø32 Ø
   ØØØØØØØØØØØØØØØØØØ ØØØØØØØ
   ØØØØØØØØØØØØ        :REM*164
44Ø DATA                :REM*57
```

■

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Connex

Challenge your eye and your hand with this Tetris-type game for the C-128.

By LEONARD MORRIS

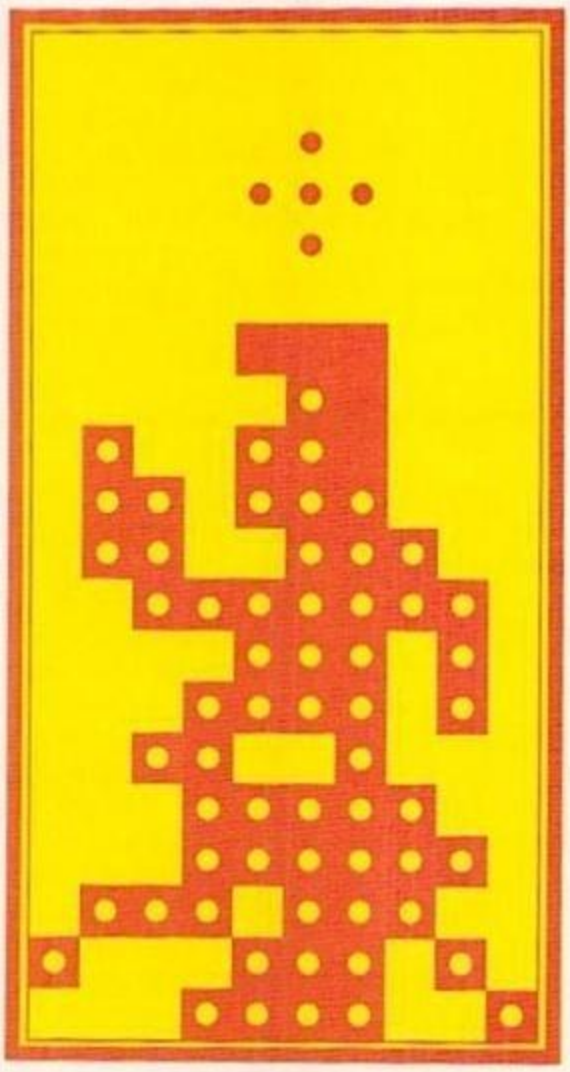
Want to make some good connections? Then get to know Connex, a C-128 game that's reminiscent of the currently popular Tetris. The object of Connex is to place randomly generated patterns of five dots on the gameboard so they connect to each other and fill as many board spaces as possible.

Connex can accommodate one or two players, and two can share the same gameboard or have separate boards. Players 1 and 2 use joysticks in ports 1 and 2, respectively.

When the first pattern appears at the top of the screen, move it onto the gameboard so it touches the single dot already there; then, before the timer runs out, press the firebutton to place the pattern. You earn points according to the number of dots in the pattern that touch the single dot. If the pattern doesn't touch the dot, overlaps the dot or hangs partly off the gameboard, or if time runs out, you're charged with an error and lose the pattern and the turn.

When the second pattern appears, connect it to the first, and so forth, always filling as many spaces on the board as possible. Unlike Tetris, you can move a new Connex pattern across the patterns already placed.

If you make four errors, the game ends and you must start over, but if you



fill 75 percent of the board, you advance to the next level of play. You can also advance to the next level—and receive an extra 1000 points—by completely filling a row with dots. That row then vanishes and the rows above it move down to take up the space.

Connex has 16 levels, each made more difficult than the last by an increasing number of predator circles that meander around the gameboard. If one of these circles touches a pattern you've moved onto the board but haven't yet placed, you lose the pattern and are charged with an error.

When two are playing, the color of the random pattern indicates whose turn it is. If the pattern is yellow, it's the first player's turn; if it's red, the second player moves. Although there's a time limit for each turn, I didn't put a timer on the screen, both to heighten suspense and because the action is too fast to watch it, anyway.

As you play, three numbers are always displayed on the screen: your current score, your error status and the percentage of the board you've covered so far.

Type in Connex using *RUN*'s Checksum program to detect any typing errors, and make sure you save the program to disk before running it. Then go ahead and make some good connections! R

Leonard Morris is an electronics technician and freelance C-128 programmer.

Listing 1. Connex program. (Available on ReRun disk. See order card facing page 24.)

```
1 REM CONNEXS -- LEONARD MORRIS
                              :REM*69
5 FAST:MA=4:SW=75:DIMCE(16),SN(
  16),RP(16):GOSUB58:GRAPHICØ,1
  :COLORØ,1:COLOR4,1          :REM*8
6 REM OPTIONS                 :REM*127
7 SLOW:WINDOWØ,Ø,39,24,1:PRINTT
  AB(7)"{CTRL 2}{2 CRSR DNs}{CT
  RL G}NUMBER OF PLAYERS (1 OR
  2)":GETKEYN$                :REM*85
8 NP=VAL(N$):IFNP=ØORNP>2THENSO
  UND1,4ØØ,2Ø:GOTO7           :REM*15Ø
9 IFNP=2THENPRINTTAB(7)"{CTRL G
  }{CRSR DN}{COMD 6}{CTRL G}GAM
  EBOARD ({CTRL 9}S{CTRL Ø}AME
  OR {CTRL 9}D{CTRL Ø}IFFERENT
  )":ELSE11                   :REM*11Ø
1Ø GETKEYGB$:IFGB$="S" ORGB$="D
   "THEN11:ELSESOUND1,5ØØ,2Ø:GO
   TO1Ø                       :REM*82
11 PRINTTAB(5)"{CRSR DN}{CTRL G
   }{COMD 7}TIME LIMIT/ MOVE ({
   CTRL 9}S{CTRL Ø}HORT OR {CTR
   L 9}L{CTRL Ø}ONG)"         :REM*229
12 GETKEYY$:IFY$="S"THENTM=7:EL
   SETM=15                    :REM*2Ø2
13 REM GAMEBOARD              :REM*2Ø6 ►
```

RUN it right: **C-128 (in 40-Column mode); one or two joysticks**

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- Serial & parallel interfaces.
- Mouse port.
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CONNEX

```
14 PRINT"{SHFT CLR}{6 CRSR DNs}
   {CRSR RT}{CTRL 2}{CTRL 9}{CO
   MD A}";:FORT=ØTO24:PRINT"{SH
   FT *}";:NEXT:PRINT"{COMD S}"
                          :REM*229
15 FORT=ØTO15:PRINT"{CRSR RT}{C
   TRL 9}{SHFT -}";TAB(27)"{SHF
   T -}":NEXT             :REM*229
16 PRINT"{CRSR RT}{CTRL 9}{COMD
    Z}";:FORT=ØTO24:PRINT"{SHFT
    *}";:NEXT:PRINT"{COMD X}"
                          :REM*132
17 FORT=1TO2:IFSC(T)>HSTHENHS=S
   C(T):NEXT:ELSENEXT     :REM*255
18 REM SCORES             :REM*193
19 WINDOW29,19,39,24,1:PRINT"{C
   TRL 9}{COMD 6}* CONNEXS *":P
   RINT"{CTRL 9}{CTRL 6}{3 SPAC
   Es}HIGH{7 SPACEs}SCORE{3 SPA
   CEs}{CTRL 4}";:PRINTUSING"##
   #,###,###";HS          :REM*63
2Ø WINDOWØ,Ø,39,24:CHAR1,14,22,
   "{SHFT Q}",1:FORT=1TO8:CP(T)
   =Ø:NE(T)=Ø             :REM*16Ø
21 SC(T)=Ø:LV(T)=1:MOVSPRT,1ØØ,
   16Ø:NEXT:SK=1:SQ=Ø:SYS5952
                          :REM*58
22 SC=Ø:FORT=1TONP:POKES1+1,N2(
   T):SYSS1:PN=T:GOSUB42:GOSUB4
   9:GOSUB45:NEXT:PN=Ø    :REM*115
23 REM TURN               :REM*3Ø
24 PN=PN+1+(PN=NP)*NP:FORT=1TO5
   :SPRITET,1,PC(PN):NEXT:POKE2
   54,PC(PN)-1            :REM*133
25 SYSHM:WINDOWØ,24,39,24,1:COL
   OR5,PC(PN)             :REM*157
26 PRINTTAB(7)"{CTRL 9}{2 SPACE
   s}LEVEL #"STR$(LV(PN))" {CTR
   L Ø}";:IFCP(PN)THEN24
                          :REM*136
27 IFGB$="D"ANDSKTHENPOKES1+1,N
   1(PN):SYSS1:POKER1+1,N2(PN):
   SYSR1:IFSQTHENSK=Ø     :REM*74
28 SOUND1,5ØØØØ,2Ø:POKEKS,SN(LV
   (PN)):SYSRP(LV(PN))    :REM*192
29 POKEIS,1:POKEBC,Ø:TI$="ØØØØØ
   Ø"                     :REM*1Ø
3Ø J=JOY(PN):SYSCC(CE(LV(PN)))
                          :REM*59
31 REM INTERACTIONS       :REM*171
32 RD=RD+1:IFRD=4THENRD=Ø:RK=RK
   +1+(RK=2)*3:POKERF+RK*2,INT(
   RND(1)*8)              :REM*6
33 IFVAL(RIGHT$(TI$,2))>TMTHENS
   YSPB:GOTO38            :REM*198
34 IFJ>127THENPOKEIS,Ø:SYSPB:GO
   TO38                   :REM*224
35 IFJTHENSYSJS(J):SOUND1,5ØØØ,
   1                      :REM*135
36 IFPEEK(BC)THENPOKEIS,Ø:NE(PN
   )=NE(PN)+1:POKEBC,Ø:SOUND2,9
   999,3Ø:GOSUB45:GOTO46
                          :REM*228
37 GOTO3Ø                 :REM*165
38 IFPEEK(BC)THENPOKEIS,Ø:SC=-1
   ØØ*LV(PN):NE(PN)=NE(PN)+1:GO
   SUB42:POKEBC,Ø:GOSUB45:GOTO4
   6                      :REM*167
39 SC=LV(PN)*1Ø*PEEK(25Ø):GOSUB
   49:IFYP>SWTHENGOSUB51
                          :REM*2Ø1
4Ø SYSL1:IFPEEK(LC)THENSC(PN)=S
   C(PN)+1ØØØ:NE(PN)=NE(PN)-1:L
   V(PN)=LV(PN)+1+(LV(PN)=16):G
   OSUB45                 :REM*135
41 GOSUB42:GOTO23         :REM*221
42 SC(PN)=SC(PN)+SC       :REM*5Ø
43 WINDOW(PN-1)*16+2,Ø,(PN-1)*1
   6+12,2,1:COLOR5,PC(PN):PRINT
   "{CTRL 9}{2 SPACEs}PLAYER{2
   SPACEs}"               :REM*11
44 PRINT"{CTRL 9} #{CTRL G}"STR
   $(PN)" SCORE":PRINT"{CTRL 9}
   {COMD 8}";:PRINTUSING"##,###
   ,###";SC(PN);:RETURN:REM*245
45 WINDOW(PN-1)*16+2,4,(PN-1)*1
   6+12,5,1:COLOR5,PC(PN):PRINT
   "{CTRL Ø}{2 SPACEs}ERRORS":P
   RINT" LEFT "MA-NE(PN)-1;:RET
   URN                    :REM*56
46 IFNE(PN)=MATHENWINDOWØ,24,39
   ,24,1:COLOR5,PC(PN):PRINT"{C
   TRL 9} PLAYER #"PN"{CRSR LF}
    YOUR GAME IS OVER";:CP(PN)=
   1:GOSUB53:SQ=1:IFNP=1THEN55
                          :REM*8
47 IFCP(1)=1ANDCP(2)=1THEN55
                          :REM*2
48 GOTO23                 :REM*183
49 SYSCK:YP=1ØØ*(256*PEEK(V2)+P
   EEK(V1))/4ØØ           :REM*136
5Ø COLOR5,PC(PN):WINDOW3Ø,4+(PN
   -1)*6,39,(PN-1)*6+8,1:PRINT"
   {CTRL 9}PLAYER #"STR$(PN):PR
   INT"{CTRL 9}{2 SPACEs}COVERE
   D {CTRL 2}";:PRINTUSING"####
   ##.##";YP;:PRINT"%":RETURN
                          :REM*53
51 WINDOW6,1Ø,21,18,1:PRINT"{CT
   RL 2}{CRSR DN}{3 SPACEs}YOU
   HAVE":PRINT"{2 SPACEs}PASSED
    THE":PRINT" "SW"% MARK":FOR
   T=1TO5:SOUND1,T*1ØØØ,2Ø:SLEE
   P1:NEXT:SYSCS:LV(PN)=LV(PN)+
   1:NE(PN)=NE(PN)-1      :REM*24Ø
52 WINDOWØ,Ø,39,24:CHAR1,14,22,
   "{SHFT Q}",1:RETURN    :REM*235
53 FORT=1TO3:SOUNDT,4ØØ*T,6Ø:SL
   EEP1:NEXT:WINDOWØ,24,39,24,1
   :RETURN                :REM*24
54 REM GAME OVER          :REM*236
55 WINDOW4,11,26,15,1:PRINT"{2
   CRSR DNs}{CTRL 8}{CTRL 9} TH
   E GAME IS NOW OVER {CTRL Ø}{
   CRSR DN}":PRINT"{CTRL 2} PRE
   SS {CTRL 9}*{CTRL Ø} FOR NEW
    GAME":POKEKS,Ø        :REM*14Ø
56 GETKEYY$:IFY$="*"THEN7:ELSE5
   6                      :REM*227
57 REM SPRITES            :REM*141
58 FAST:GRAPHIC1,1:CHAR1,Ø,Ø,"{
   SHFT Q}":SSHAPESY$,Ø,Ø,23,21
   :FORT=1TO5:SPRSAVSY$,T
                          :REM*62
59 SPRITET,Ø,2:NEXT:GRAPHIC1,1:
   FORT=6TO8:SPRITET,Ø,T+3:NEXT
                          :REM*137
6Ø FORT=2TO3:CIRCLE1,8,8,T,T:NE
   XT:SSHAPESY$,Ø,Ø,23,21:SPRSA
   VSY$,6:GRAPHIC1,1      :REM*3Ø
61 FORT=3TO4:CIRCLE1,8,8,T,T:NE
   XT:SSHAPESY$,Ø,Ø,23,21:SPRSA
   VSY$,7:GRAPHIC1,1      :REM*213
62 FORT=4TO6:CIRCLE1,8,8,T,T:NE
   XT:SSHAPESY$,Ø,Ø,23,21:SPRSA
   VSY$,8                 :REM*157
63 SLOW:GRAPHIC2,1,15:COLOR4,1:
   COLORØ,1:CHAR,Ø,24,"CONNEXS"
   ,1:COLOR1,2            :REM*231
64 FORX=ØTO56:FORY=ØTO8:LOCATEX
   ,Y+19Ø:IFRDOT(2)THENBOX1,X*5
   +2Ø,Y*5+5Ø,X*5+25,Y*5+55,45,
   1                      :REM*4Ø
65 NEXT:NEXT:COLOR1,6:CHAR1,1Ø,
   14," ONE MOMENT PLEASE ",1
                          :REM*2Ø
66 REM VARIABLES          :REM*68
67 BC=6655:POKEBC,Ø:LC=BC-1:CS=
   5512:CK=5971:IS=6138:L1=5469
   :V1=5894:V2=V1+1       :REM*154
68 P1=13Ø6:P2=6656:C2=P2+32:PB=
   521Ø:R1=5685:S1=5627:RF=1433
   6:POKERF,2             :REM*92
69 HM=6165:KS=53269:M(1)=5783:M
   (2)=582Ø:POKE5781,61:REM*171
7Ø FORT=ØTO15:P3=INT(P1/256):C3
   =P3+212:P4=P1-256*P3:POKEP2+
   T*2,P3                 :REM*9Ø
71 POKEC2+T*2,C3:POKEP2+1+T*2,P
   4:POKEC2+1+T*2,P4:P1=P1+4Ø:N
   EXT                    :REM*114
72 FORT=1TO8:READJS$:JS(T)=DEC(
   JS$):NEXT:FORT=ØTO3:READJS$:
   CC(T)=DEC(JS$):NEXT    :REM*117
73 N2(1)=32:N2(2)=48:N1(1)=48:N
   1(2)=32:PC(1)=8:PC(2)=3
                          :REM*224
74 FORT=4864TO6386:READA$:POKET
   ,DEC(A$):NEXT:GRAPHICØ,1
                          :REM*49
75 SYSDEC("1338"):FORT=ØTO15:FO
   RU=ØTO4:READY:POKEDEC("1CØØ"
   )+T*16+Y,1:NEXT:NEXT:REM*166
76 FORT=1TO16:READSN(T),RP(T),C
   E(T):NEXT:RETURN       :REM*175
77 DATA 17CØ,17D4,1784,17DA,17A
   C,17EØ,1798,17E6,132C,1881,1
   3ØØ,1836               :REM*84
78 DATA AØ,ØØ,EE,FF,1A,AD,FF,1A
   ,29,ØF,FØ,F6,85,FE,B9,2Ø,1A,
   8D,2Ø,13,B9,21         :REM*1
79 DATA 1A,8D,1F,13,A2,ØØ,A5,FE
   ,9D,72,DB,E8,EØ,19,DØ,F6,C8,
   C8,CØ,2Ø,DØ,D6         :REM*2
8Ø DATA 6Ø,FØ,Ø6,A9,Ø1,8D,FF,19
   ,6Ø,4C,97,14,A2,ØØ,A9,ØØ,9D,
   ØØ,1C,E8,DØ,F8         :REM*21Ø
81 DATA 6Ø,FØ,FE,A2,ØØ,BD,CØ,1C
   ,9D,ØØ,ØB,E8,EØ,1Ø,DØ,F5,2Ø,
   19,14,6Ø,A2,Ø3         :REM*158
82 DATA AØ,ØØ,2Ø,7Ø,13,A2,Ø2,2Ø
   ,7Ø,13,A2,Ø1,2Ø,7Ø,13,A2,ØØ,
   2Ø,7Ø,13,2Ø,19         :REM*1
83 DATA 14,6Ø,A9,Ø4,85,FE,BD,CØ
   ,1C,99,ØØ,ØB,C8,E8,E8,E8,E8,
   C6,FE,DØ,F1,6Ø         :REM*69
84 DATA A2,ØØ,AØ,Ø3,2Ø,A4,13,A2
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CONNEX

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   ,Ø1,AØ,Ø7,2Ø,A4,13,A2,Ø2,AØ,
   ØB,2Ø,A4,13,A2        :REM*25Ø
85 DATA Ø3,AØ,ØF,2Ø,A4,13,2Ø,19
   ,14,6Ø,A9,Ø4,85,FE,BD,CØ,1C,
   99,ØØ,ØB,88,E8        :REM*225
86 DATA E8,E8,E8,C6,FE,DØ,F1,6Ø
   ,ØØ,A2,ØF,AØ,ØØ,B9,CØ,1C,9D,
   ØØ,ØB,CA,C8,CØ        :REM*143
87 DATA 1Ø,DØ,F4,2Ø,19,14,6Ø,A2
   ,ØØ,AØ,ØØ,BD,D6,11,DD,1Ø,ØB,
   FØ,ØF,1Ø,Ø8,FE        :REM*13Ø
88 DATA D6,11,AØ,Ø1,4C,E8,13,DE
   ,D6,11,AØ,Ø1,BD,D7,11,DD,11,
   ØB,FØ,ØF,1Ø,Ø8          :REM*7
89 DATA FE,D7,11,AØ,Ø1,4C,FF,13
   ,DE,D7,11,AØ,Ø1,E8,E8,EØ,ØA,
   DØ,CC,A9,Ø2,85          :REM*8
9Ø DATA FE,A9,ØØ,85,FD,C6,FD,DØ
   ,FC,C6,FE,DØ,F4,98,DØ,B5,6Ø,
   AØ,ØØ,84,FA,A9        :REM*217
91 DATA ØØ,85,FB,A5,FA,ØA,ØA,18
   ,65,FB,AA,BD,ØØ,ØB,FØ,18,A5,
   FB,ØA,ØA,ØA,18         :REM*59
92 DATA 69,8Ø,99,1Ø,ØB,A5,FA,ØA
   ,ØA,ØA,18,69,32,99,11,ØB,C8,
   C8,E6,FB,A5,FB        :REM*191
93 DATA C9,Ø4,DØ,D3,E6,FA,A5,FA
   ,C9,Ø4,DØ,C7,2Ø,CD,13,6Ø,A2,
   ØØ,BD,D6,11,38         :REM*2Ø
94 DATA E9,18,4A,4A,4A,85,FA,BD
   ,D7,11,38,E9,32,4A,4A,4A,85,
   FB,A9,Ø4,85,FD         :REM*23
95 DATA A5,FA,85,FC,A5,FB,FØ,1Ø
   ,A5,FC,18,69,28,85,FC,9Ø,Ø2,
   E6,FD,C6,FB,4C        :REM*163
96 DATA 7A,14,AØ,ØØ,B1,FC,C9,2Ø
   ,4C,2D,13,A5,FC,9D,3Ø,ØB,A5,
   FD,9D,31,ØB,E8         :REM*31
97 DATA E8,EØ,ØA,DØ,B5,4C,DA,14
   ,A5,FC,38,E9,28,85,FC,BØ,Ø2,
   C6,FD,B1,FC,C9        :REM*166
98 DATA D1,6Ø,A5,FC,18,69,27,85
   ,FC,9Ø,Ø2,E6,FD,B1,FC,C9,D1,
   6Ø,A5,FC,18,69        :REM*22Ø
99 DATA Ø2,85,FC,9Ø,Ø2,E6,FD,B1
   ,FC,C9,D1,6Ø,AØ,ØØ,84,FA,A2,
   ØØ,BD,3Ø,ØB,85        :REM*167
1ØØ DATA FC,BD,31,ØB,85,FD,2Ø,A
    A,14,DØ,Ø2,E6,FA,2Ø,BA,14,D
    Ø,Ø2,E6,FA,2Ø,CA    :REM*234
1Ø1 DATA 14,DØ,Ø2,E6,FA,2Ø,BA,1
    4,DØ,Ø2,E6,FA,E8,E8,EØ,ØA,D
    Ø,D4,A5,FA,DØ,Ø3     :REM*98
1Ø2 DATA 4C,2F,13,A2,ØØ,BD,3Ø,Ø
    B,85,FC,BD,31,ØB,85,FD,A9,D
    1,91,FC,E8,E8,EØ    :REM*251
1Ø3 DATA ØA,DØ,EC,6Ø,AD,Ø7,DC,2
    9,ØF,ØA,ØA,ØA,ØA,8D,48,13,8
    D,75,13,8D,A9,13      :REM*4
1Ø4 DATA 8D,BE,13,EE,2F,ØB,AD,2
    F,ØB,29,Ø3,DØ,Ø3,4C,45,13,C
    9,Ø1,DØ,Ø3,4C,56    :REM*253
1Ø5 DATA 13,C9,Ø2,DØ,Ø3,4C,84,1
    3,4C,B9,13,A9,ØØ,8D,FE,19,A
    Ø,ØØ,B9,ØØ,1A,8D    :REM*234
1Ø6 DATA 74,15,B9,Ø1,1A,8D,73,1
    5,A2,ØØ,BD,72,Ø7,C9,2Ø,FØ,Ø
    8,E8,EØ,19,DØ,F4     :REM*96
1Ø7 DATA 2Ø,B2,15,C8,C8,CØ,2Ø,D
    Ø,DD,6Ø,AØ,ØØ,B9,ØØ,1A,8D,9
    C,15,B9,Ø1,1A,8D     :REM*99
1Ø8 DATA 9B,15,A2,ØØ,A9,2Ø,9D,7
    2,Ø7,E8,EØ,19,DØ,F6,C8,C8,C
    Ø,2Ø,DØ,E2,6Ø,ØØ    :REM*165
1Ø9 DATA 19,DØ,FØ,6Ø,EA,EA,EA,6
    Ø,EE,FE,19,98,8D,FC,19,AD,7
    4,15,8D,E9,15,8D     :REM*79
11Ø DATA EC,15,AD,73,15,8D,E8,1
    5,AD,E8,15,38,E9,28,8D,E8,1
    5,8D,EB,15,BØ,Ø6    :REM*129
111 DATA CE,E9,15,CE,EC,15,AD,E
    C,15,C9,Ø4,FØ,13,A2,ØØ,AØ,2
    8,BD,F2,Ø4,99,F2    :REM*138
112 DATA Ø4,C8,E8,EØ,19,DØ,F4,4
    C,C8,15,2Ø,EC,17,A8,6Ø,A9,3
    Ø,8D,1A,16,A9,ØØ     :REM*67
113 DATA 8D,19,16,AØ,ØØ,B9,ØØ,1
    A,8D,17,16,B9,Ø1,1A,8D,16,1
    6,A2,ØØ,BD,72,Ø7    :REM*157
114 DATA 9D,8Ø,32,E8,EØ,19,DØ,F
    5,AD,19,16,18,69,28,8D,19,1
    6,9Ø,Ø3,EE,1A,16    :REM*1Ø7
115 DATA C8,C8,CØ,2Ø,DØ,D3,6Ø,A
    9,2Ø,8D,51,16,A9,ØØ,8D,5Ø,1
    6,AØ,ØØ,B9,ØØ,1A    :REM*1Ø9
116 DATA 8D,54,16,B9,Ø1,1A,8D,5
    3,16,A2,ØØ,BD,8Ø,22,9D,72,Ø
    7,E8,EØ,19,DØ,F5    :REM*249
117 DATA AD,5Ø,16,18,69,28,8D,5
    Ø,16,9Ø,Ø3,EE,51,16,C8,C8,C
    Ø,2Ø,DØ,D3,6Ø,EA    :REM*255
118 DATA A2,ØØ,A9,ØØ,9D,ØØ,ØB,E
    8,EØ,1Ø,DØ,F6,A2,Ø5,AD,Ø6,D
    C,29,ØF,A8,B9,ØØ    :REM*199
119 DATA ØB,DØ,F5,A9,Ø1,99,ØØ,Ø
    B,CA,DØ,ED,4C,19,14,FF,3E,B
    D,E1,11,C9,62,FØ    :REM*224
12Ø DATA Ø3,DE,E1,11,6Ø,BD,E1,1
    1,C9,E2,FØ,Ø3,FE,E1,11,6Ø,B
    D,EØ,11,C9,1D,FØ    :REM*146
121 DATA Ø3,DE,EØ,11,6Ø,BD,EØ,1
    1,C9,E8,FØ,Ø3,FE,EØ,11,6Ø,E
    E,94,16,AD,94,16    :REM*171
122 DATA FØ,Ø1,6Ø,A9,FE,8D,94,1
    6,EE,95,16,AD,95,16,C9,4Ø,D
    Ø,Ø5,A9,3D,8D,95    :REM*2Ø8
123 DATA 16,8D,FF,Ø7,8D,FE,Ø7,8
    D,FD,Ø7,A2,ØØ,BD,ØØ,38,29,Ø
    7,ØA,ØA,ØA,EA,8D      :REM*18
124 DATA F7,16,2Ø,2Ø,17,E8,E8,E
    Ø,Ø6,DØ,EB,6Ø,2Ø,96,16,4C,9
    6,16,Ø1,ØØ,2Ø,96    :REM*247
125 DATA 16,4C,B7,16,EA,EA,2Ø,B
    7,16,4C,B7,16,EA,EA,2Ø,B7,1
    6,4C,A1,16,EA,EA    :REM*146
126 DATA 2Ø,A1,16,4C,A1,16,EA,E
    A,2Ø,A1,16,4C,AC,16,EA,EA,2
    Ø,AC,16,4C,AC,16     :REM*55
127 DATA EA,EA,2Ø,96,16,4C,AC,1
    6,FF,EA,78,A9,17,8D,15,Ø3,A
    9,4D,8D,14,Ø3,58    :REM*2Ø8
128 DATA 6Ø,2Ø,ØØ,18,4C,65,FA,A
    Ø,ØØ,8C,Ø6,17,8C,Ø7,17,B9,Ø
    Ø,1A,8D,6B,17,B9     :REM*84
129 DATA Ø1,1A,8D,6A,17,A2,ØØ,B
    D,72,Ø7,C9,D1,DØ,Ø8,EE,Ø6,1
    7,DØ,Ø3,EE,Ø7,17    :REM*119
13Ø DATA E8,EØ,19,DØ,EC,C8,C8,C
    Ø,2Ø,DØ,D8,6Ø,AØ,Ø8,A2,ØØ,F
    E,D6,11,E8,E8,EØ    :REM*165
131 DATA ØA,DØ,F7,88,DØ,F2,EA,E
    A,EA,6Ø,AØ,Ø8,A2,ØØ,DE,D6,1
    1,E8,E8,EØ,ØA,DØ    :REM*231
132 DATA F7,88,DØ,F2,EA,EA,EA,6
    Ø,AØ,Ø8,A2,ØØ,FE,D7,11,E8,E
    8,EØ,ØA,DØ,F7,88     :REM*38
133 DATA DØ,F2,EA,EA,EA,6Ø,AØ,Ø
    8,A2,ØØ,DE,D7,11,E8,E8,EØ,Ø
    A,DØ,F7,88,DØ,F2    :REM*1Ø6
134 DATA EA,EA,EA,6Ø,2Ø,84,17,4
    C,CØ,17,2Ø,84,17,4C,AC,17,2
    Ø,98,17,4C,AC,17    :REM*219
135 DATA 2Ø,98,17,4C,CØ,17,A2,1
    9,A9,2Ø,9D,19,Ø5,CA,DØ,F8,A
    D,FC,19,6Ø,Ø1,FF     :REM*94
136 DATA ØØ,FF,ØØ,8E,AD,FA,17,F
    Ø,ØA,AD,1E,DØ,29,1F,FØ,Ø3,8
    D,FF,19,2Ø,C2,16    :REM*1Ø8
137 DATA 6Ø,FF,ØØ,AØ,ØØ,B9,2Ø,1
    A,8D,29,18,B9,21,1A,8D,28,1
    8,A2,ØØ,A5,FE,9D     :REM*97
138 DATA 72,DB,E8,EØ,19,DØ,F6,C
    8,C8,CØ,2Ø,DØ,E2,6Ø,AØ,ØØ,B
    9,2Ø,1A,8D,52,18    :REM*211
139 DATA B9,21,1A,8D,51,18,A2,Ø
    Ø,EE,FF,1A,AD,FF,1A,29,ØF,F
    Ø,F6,9D,72,DB,E8    :REM*1Ø1
14Ø DATA EØ,19,DØ,EE,C8,C8,CØ,2
    Ø,DØ,DA,6Ø,FF,AØ,ØØ,B9,2Ø,1
    A,8D,74,18,B9,21    :REM*24Ø
141 DATA 1A,8D,73,18,A2,ØØ,A5,F
    E,9D,72,DB,E8,EØ,19,DØ,F6,C
    8,C8,CØ,2Ø,DØ,E2    :REM*218
142 DATA 6Ø,E6,FE,A5,FE,29,ØF,F
    Ø,F8,85,FE,4C,6Ø,18,A2,ØØ,A
    9,ØØ,9D,ØØ,ØB,E8    :REM*183
143 DATA EØ,1Ø,DØ,F6,A2,Ø5,AD,Ø
    6,DC,29,ØF,C9,Ø3,FØ,F7,C9,Ø
    7,FØ,F3,C9,ØA,1Ø      :REM*Ø
144 DATA EF,A8,B9,ØØ,ØB,DØ,E9,A
    9,Ø1,99,ØØ,ØB,CA,DØ,E1,4C,1
    9,14,A2,ØØ,A9,ØØ    :REM*24Ø
145 DATA 9D,ØØ,ØB,E8,EØ,1Ø,DØ,F
    6,A2,Ø5,AD,Ø6,DC,29,ØF,C9,Ø
    5,FØ,F7,C9,Ø6,FØ    :REM*221
146 DATA F3,C9,Ø9,FØ,EF,C9,ØA,F
    Ø,EB,A8,B9,ØØ,ØB,DØ,E5,A9,Ø
    1,99,ØØ,ØB,CA,DØ    :REM*1Ø4
147 DATA DD,4C,19,14,ØØ :REM*68
148 DATA Ø,4,8,12,13,1,4,5,6,9,
    Ø,4,8,12,5,Ø,1,5,6,9,Ø,1,5,
    9,1Ø,Ø,1,2,5,9,Ø,1,5:REM*95
149 DATA 9,8,1,2,5,6,9,Ø,4,8,12
    ,9,Ø,4,8,12,1,5,6,8,9,1Ø,1,
    5,6,1Ø,11,Ø,1,2,6,1Ø
                          :REM*113
15Ø DATA 1,2,4,5,9,1,2,5,6,1Ø,2
    ,6,1Ø,14,9,31,5418,Ø,63,541
    8,1,127,5418,2,255 :REM*174
151 DATA 5418,3,31,6286,Ø,63,62
    86,1,127,6286,2,255,6286,3,
    31,6334,Ø,63,6334  :REM*248
152 DATA 1,127,6334,2,255,6334,
    3,255,5744,Ø,127,5744,1,127
    ,5744,2,255,5744,3 :REM*238
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GOLD MINE

Get the edge on your opponents by mastering these game tips.

By LOUIS F. SANDER

ARKANOID: When leaving a level, write down the exit you used. Usually there's one hard board and one easy board for each level, so you should know the easy one.

—DAVID SHEELY
ADDRESS UNKNOWN

BATMAN: In the Joker game, put on the Gas Mask when you enter the sewers and bring the Flashlight.

In one tent, you'll find slot machines that can pay off nicely. Get money from another tent. Keep playing the machines until you hit the jackpot.

—R. C. MILLER
BERWICK, PA

BATTLETECH: House Kurita (the Draconis Combine) will attack the Citadel by your sixth training mission. You should have built up your skills by then, because you won't have another opportunity. Apply for apprenticeship at the Mechit Lube.

The map room is confusing. When you come to it, touch the planets Pesht, Benjamin, Skye, Summer, Ryerson, Kathil and Achernar to turn them into squares. Then touch the computer on the wall. Go to the Hyperpulse Generator, contact Katrina and win.

—STEVE CAVE
MEDFORD, OR

CAVEMAN UGH-LYMPICS: In the Firemaking event, start by hitting your opponent in the head. It'll give you a nice lead. As soon as you get smoke, take large breaths. You'll get the fire started quicker, and you won't get dizzy. In some events, you must jiggle the joystick as fast as you can. This is hazardous to your joystick, so use an old Atari or other inexpensive joystick.

—TODD SINCLAIR
SUISUN, CA

CURSE OF THE AZURE BONDS: This applies in Zhentil Keep: When you go upstairs in the Zhentil Inn, you'll find another exit to your room. Go through this door, and you'll be in a hall with different stores, including a Magic Shop. But beware! You won't be able to get out. If you want to enter any of the shops, do it from the front exit on the street.

In Yulash, when you enter the pit, follow the bread scent until you find Alias and Goldmoon, who'll help you kill Moander and his fanatics.

—STEVIE MELENDEZ
BAILEYTON, AL

DOUBLE DRAGON: This works in a two-player game: When you walk down the road, wait for an enemy to come out. If only one appears, let him follow you to the top of the screen, then jump up, and he will freeze. Now your partner can beat him up. Be sure to stay in the air, because if you approach the enemy, he'll thaw out and come after you. The secret is to let your partner do the dirty work.

—CONNIE MCCARTHY
FRIENDSHIP, OH

DOUBLE DRAGON II: THE REVENGE: To kill the small guards, press the firebutton and push your joystick forward so your man does jumping sidekicks. Press the button on and off repeatedly, making sure your man is standing over the guards. To kill the large guards, punch and kick continuously. These two methods will easily let you go from level one to level five.

—TIM FRITZSCHE
CHANDLER, AZ

GRAND PRIX CIRCUIT: Try each race car to see which you're most comfortable with. Beginners should try the Ferrari, since it's a "road hugger." The McLaren is best for speed and power.

Use the Practice feature on the tracks that are hardest for you.

The manual shift isn't as easy as in Test Drives I and II. When you're going over 200 mph and through all the turns, it's hard to shift properly. Beginners should start with auto shift.

—BEHZAD SEILSEPOUR
DALLAS, TX

HILLSFAR: Here's how to find Jared Jymn: Castle—Go to the gates and search. Rat's Nest Pub—Listen to gossip. Sewer—Look for the right chest. Arena—Defeat an enemy. Hermit's Place—Search for the right chest. Rat's Nest—Speak to the Barmaid. Haunted Mansion—Go to the northwest corner of the labyrinth, get all the treasure, then exit. Bugbear's Cave Pub—Speak to the Barmaid. Trading Post—Talk to the Trader. Fighters' Guild—Talk to the Guild Master; he'll give you $10,000 and lots of experience.

—CONTRIBUTOR UNKNOWN
DOBBS FERRY, NY

IMPOSSIBLE MISSION II: When you lay a bomb down, don't put it near anything you want to search. An explosion makes the ground disappear, and you won't be able to read your search.

—T. STUDS
KINCARDINE, ONTARIO, CANADA

MONOPOLY: Buy one property from each set. Then trade properties from sets you don't want for the one or two you need. Keep one property from the sets your opponents need. When you have one or two complete sets, just collect from the others when they land on your properties. You'll only pay single rents to your opponents. This strategy is easier to use playing solo against the computer.

—CHRIS WAHL
BOYCE, VA

TEST DRIVE II: THE DUEL: Choose the Ferrari F40. It has faster acceleration.

Just before entering the first tunnel on Level 4, the radar detector will beep. Slow down until you're inside. The ra-

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dar detector will then beep again. Now accelerate. You're out of radar range when you exit the tunnel.

—Robert Danzer
Address unknown

Sim City: To increase your city's funds, turn off your monitor and disk drive and leave the computer on for several hours. Your funds will then be at least $64,000!

—Roseanne Carr
Sims, CA

Times of Lore: Making a map of this game helped me solve it in under two hours.

Find the urn carrying the foretelling stones by killing a certain orc at the orc camp. Find the ring by killing the giant, east of Rhyder.

The Tablet of Truth is on the first floor of Heidric's castle. Buy the magical ax from a serf in Lankwell and the magical boots from a serf in Treela.

The Black Asp can give you the confession of the assassin. To find a note, kill the guard who runs around at night outside Heidric's castle. In a castle northeast of Hampton, you can find a key by killing the first guard. The same building contains a green scroll on a table.

Buy the holy water from Friar Kaine in Rhyder. After you kill the Lyche, return to Irial; he'll give you another key to get into the caves. The chimes at the end of a tough maze in the caves can get you into Grey Abbot's castle. Go to the second floor and take the invisible sphere from the bed. Kill the Grey Abbot with it, then pick up the medallion to win the game.

—Erik Haslam
South Milwaukee, WI

Wasteland: Here are some tips for making a party: Make a leader-type character with high perception, high rifle, high assault rifle, medic, silent movement, swim, climb, clip pistol and confidence. When the game begins, go to Quartz, sell his pistol and ammo, and buy him an M17 carbine with 10–15 7.62mm clips.

Make a big, strong character with high brawling, pugilism, high clip pistol, assault rifle and an AT weapon; make a thief-type character with high perception, high gamble, sleight of hand, acrobat, picklock, silent movement, confidence, alarm disarm, safecrack, clip pistol and assault rifle; make a doctor character with high medic, high clip pistol, rifle, assault rifle and forgery.

As soon as possible, go to the black market in Darwin. Sell the leader's M17 and buy an M1989A1 NATO assault rifle, which holds more bullets than an AK97. When everybody has an M1989A1, get the leader an AK97, which is slightly more accurate.

To get money, first make one character that you'll keep, plus three dummy characters. Go to Quartz and sell all the items from the dummy characters. Return to Ranger Center, give the money to the good character, then delete the three dummies. If you manage to do this often, you'll make about $700 each time.

—Will Rodina
Jupiter, FL

Where in [Wherever] Is Carmen Sandiego?: This works with all Carmen Sandiego games. When you start your investigation and the screen reads, "No one like that has been seen around here," stop the investigation, return to the city you just left, and try another city. This saves you four hours, because if Carmen or one of her gang is not at the first place you investigate, they won't be and will not have been at the other two.

—Gregory Green
APO, NY

Who Framed Roger Rabbit?: Keep the car behind you from passing, because he serves as your friend when you try to jump over the slime.

—Alvin Mah
Maple Ridge, B.C., Canada ■

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128 Mode

Discover the secrets of the Directory command's often unrealized capacities.

By MARK JORDAN

AMONG THE MOST POPULAR C-128 commands is Directory, which is so useful that it's even built into one of the function keys (F3). However, I fear many 128ers overlook some of the "directorial" power available to them.

The problem stems partly from the *C-128 System Guide*'s cryptic description of the command:

DIRECTORY (Ddrive number)(,<ON> Udevice)(,wild card)

The first two options—Ddrive number and ON—are useless for all practical purposes. Forget both of them.

The Udevice option lets you use Directory on a second (or third or fourth) drive, just by tacking U9, or the like, onto the end of the command, like so:

DIRECTORY U9

Don't put a comma before the U9 unless you're using a search string, as described below.

Selective Directories

DIRECTORY provides two ways to limit directory listings to what you want: with search strings and by file type. A search string is a specific string of characters used to identify the filename(s) you want listed. The string could be identical with one filename, say BOB. To list BOB alone, you'd type:

DIRECTORY "BOB"

If you're accessing a second drive, tack on ,U9 (note the preceding comma) after BOB.

Search strings really come into their own when used with the wild cards: the asterisk and the question mark. For instance, most Commodore users know that placing a mnemonic or symbolic prefix on filenames makes them easy to group using the asterisk wild card. You might place WRD. before the names of all word processing files. Then the command DIRECTORY "WRD.*" would list only word processing files.

This is old hat. But what if you want the mnemonic to be at the end of the filename, like CP/M and MS-DOS extensions? Placing it at the end makes the filenames easier to read. It would appear that DIRECTORY can't handle that with the asterisk (except when you're using the 1581). However, with the humble question mark wild card, it can. The key is in always using 16-character filenames, with the final characters constituting the suffix, or extension.

Let's say you're saving a letter to Sue. You could call it SUE_____.LTR, where the underline characters represent spaces that pad the filename proper to 12 characters (the added period and 3-letter suffix making 16). With files thus named, you could list them by extension as follows:

DIRECTORY "???????????.LTR"

You could also save yourself the bother of typing 12 question marks by assigning them to a variable, such as:

Q$="???????????"

Directory lets you use variable names for search strings in two ways: inside parentheses, as in:

DIRECTORY (Q$)

or added to another search string, as in:

DIRECTORY (Q$)+".LTR"

The second way you can get selective directory listings is by file type. To do so, you must add the expression =S (or P, R or U) after the search string. Thus, to list just sequential files, you'd type:

DIRECTORY "*=S"

Change the S to P, R or U and you'd list program, relative or user files, respectively.

Happily, these two methods of listing selective files can be combined. For example, DIRECTORY "PI*=S" will list only those sequential files whose names start with the letters PI.

Printing Directories

Unfortunately, you can't use the Directory command to print out a hard-copy of a directory. You must resort to the old C-64 method of loading the directory into memory (and thus erasing whatever is already there). At least it's simple:

LOAD "$",8

Then, to print it out, you must open a channel to the printer with:

OPEN 4,4,7:CMD 4:LIST:CLOSE 4

Wild-card search strings work here, as well. To load just those files with extension .LTR, type:

LOAD "$:???????????.LTR",8

And file-type matching works here, as well:

LOAD "$:*=S",8

Running Directories

The tricks I've described so far are all for the Immediate, or Direct, mode of operation. How about when a program is running?

Well, Directory does work within a program, but it's limited: It just scrolls the files by. To make it possible to select files from the listing, you must employ a few more tricks.

Listing 1 shows how to get all the files into an array. The key is to use a secondary address of 0 when opening the directory (see line 20). When run, this little program reads a directory and converts all the filenames into Basic subscripted variables—in this case FI$( ). FI$(0) holds the name of the disk, and FI$(1) through FI$(F) hold all the filenames. This is very useful whenever you write a program that needs to read directories for the user to cycle through.

Listing 2 provides another way. It uses the Directory command itself for selecting files from within a program. With the judicious use of the Window and Input commands, plus a couple of sneaky Pokes, you come out of this routine with FI$ holding the name of the file that was selected.

Both listings contain remarks that, ►

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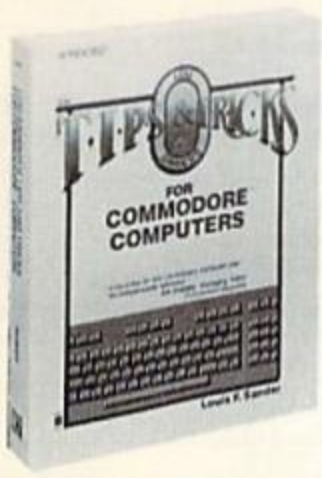

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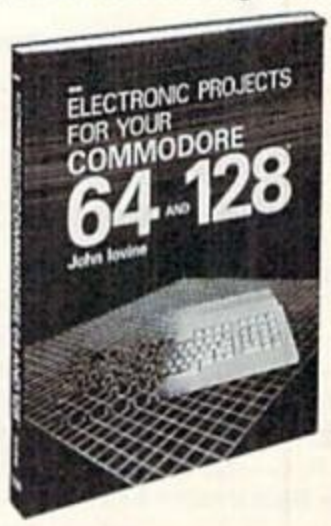

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with a little study, should enable you to use the listings as subroutines in your own programs.

Getting directories on the C-128 is a delight, especially when you know some power moves. List on, O Directory. R

Mark Jordan, whose vocation is directing high school English classes, has been programming Commodore computers for many years.

Listing 1. To place a directory in an array. (Available on ReRun disk. See order card facing page 24.)

```
5 REM SELECTIVE C-128 DIRECTORI
  ES LISTING 1              :REM*19
1Ø DIM FI$(144):ZB=8        :REM*88
2Ø OPEN 2,8,Ø,"$:*"         :REM*164
3Ø REM "$:*=S" FOR SEQUENTIAL F
   ILES ONLY                :REM*4Ø
4Ø REM "$:*=P" FOR PROGRAM FILE
   S                        :REM*232
5Ø REM "$:*=R" FOR RELATIVE FIL
   ES                       :REM*2Ø8
6Ø REM PUT ANY LETTER(S) BETWEE
   N COLON AND * FOR SELECTIVE
   DIRECTORIES              :REM*79
7Ø :                        :REM*128
8Ø DO                       :REM*58
9Ø FORT=1TOZB:GET#2,A$:IF ST TH
   EN EXIT                  :REM*99
1ØØ NEXT:ZB=16              :REM*131
11Ø FORT=1TO16:GET#2,A$:REM*139
12Ø IFA$<>CHR$(34)THEN FI$(F)=F
   I$(F)+A$                 :REM*18
13Ø NEXT                    :REM*5
14Ø PRINTFI$(F):F=F+1       :REM*71
15Ø LOOP                    :REM*131
16Ø F=F-2                   :REM*196
17Ø DCLOSE                  :REM*199
```

Listing 2. To use the Directory command within a program. (Available on ReRun disk. See order card facing page 24.)

```
5 REM SELECTIVE C-128 DIRECTORI
  ES LISTING 2              :REM*113
1Ø W=RWINDOW(2)/2:WINDOW W-14,1
   ,W+12,23,1               :REM*11Ø
2Ø PRINTCHR$(14)"{SHFT P}RESS {
   SHFT R}{SHFT U}{SHFT N}/{SHF
   T S}{SHFT T}{SHFT O}{SHFT P}
    TO HALT"                :REM*167
3Ø TRAP 4Ø:DIRECTORY        :REM*124
4Ø TRAP:CU$="{CTRL 9}---->{5 CR
   SR LFs}"                 :REM*68
5Ø WINDOW W-14,3,W+9,22:PRINT C
   HR$(27)"M"CU$;           :REM*255
6Ø DO:GETKEYA$:IFA$=CHR$(13)THE
   N EXIT                   :REM*86
7Ø PRINT"{CTRL Ø}{5 SPACEs}":PR
   INTCU$;                  :REM*153
8Ø LOOP                     :REM*61
9Ø POKE2Ø8,1:POKE842,13:REM*138
1ØØ PRINT"{CTRL Ø}{5 SPACEs}{2
    CRSR LFs}"CHR$(27)"L";
                            :REM*71
11Ø INPUT FI$               :REM*232
12Ø PRINT"{2 HOMEs}{SHFT CLR}{S
    HFT Y}OU SELECTED "FI$
                            :REM*13Ø
```

■

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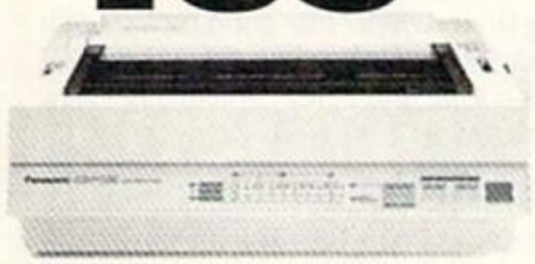

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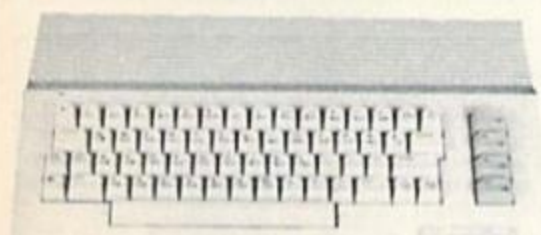

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By DONALD R. EAMON

GEOS CAN ELEVATE Commodores from simple text-based tools to graphics machines that are capable of greatness. Developing that potential to its fullest requires more hardware than just the 1351 mouse, however. Read on for a look at relatively inexpensive hardware add-ons that can, when combined with GEOS, turn your C-64 or C-128 into an impressive powerhouse.

PRINTERS

Dot matrix printers are GEOS's weakest link. Most Commodore compatibles (MPS 801, 803, 1000 or one of the many third-party C and VC models that use Commodore's serial cable) print graphics only at a low resolution of 60 dots per inch (dpi) horizontally, which results in incomplete printouts. Epson FX-80, Star NX, IBM 5152 and Epson LQ 24-pin compatibles, when linked to a Centronics parallel interface, are an improvement, since they duplicate GEOS's 80 (horizontal) by 72 (vertical) dpi screen resolution.

You can further enhance printer performance by using one of a multitude of shareware printer drivers that have appeared on QuantumLink and on Commodore BBSs across the country. Through interpolation routines, these drivers generate graphics quality far beyond the compatibles' 60 dpi and standard 80 dpi. See Figure 1 for examples of what different types of printers produce.

For most of us, a more powerful dot matrix printer improves graphics/text work done either in or out of GEOS. But, if cost is not a factor you must consider, PostScript laser printers produce the ultimate in GEOS quality. Via an RS-232 interface, lasers output near-typeset quality from geoWrite and geoPublish files.

EXPANDING GEOS

When using GEOS 2.0 with a C-64, you won't have full control of a 1581 disk drive, since the control routines don't fit into the 64's already-crowded memory. So before investing in an 800K 3½-inch disk drive, consider adding a RAM expansion unit (REU).

The REU creates an "electronic drive"; that is to say, a high-speed 1541 clone with a 1764 REU or a high-speed 1541/71 clone with a 1750 REU. This addition suffers no load/save lag and eliminates the need to place the deskTop and Configure files on work disks.

Today, RAM expansion has a "bad news/good news" aspect. The bad news is that Commodore stopped making REUs just as computerists were discovering their worth. The good news is that GEOS 2.0 still supports the 1750/1764 series—and Berkeley Softworks' new GEORAM 512, as well.

GEORAM 512

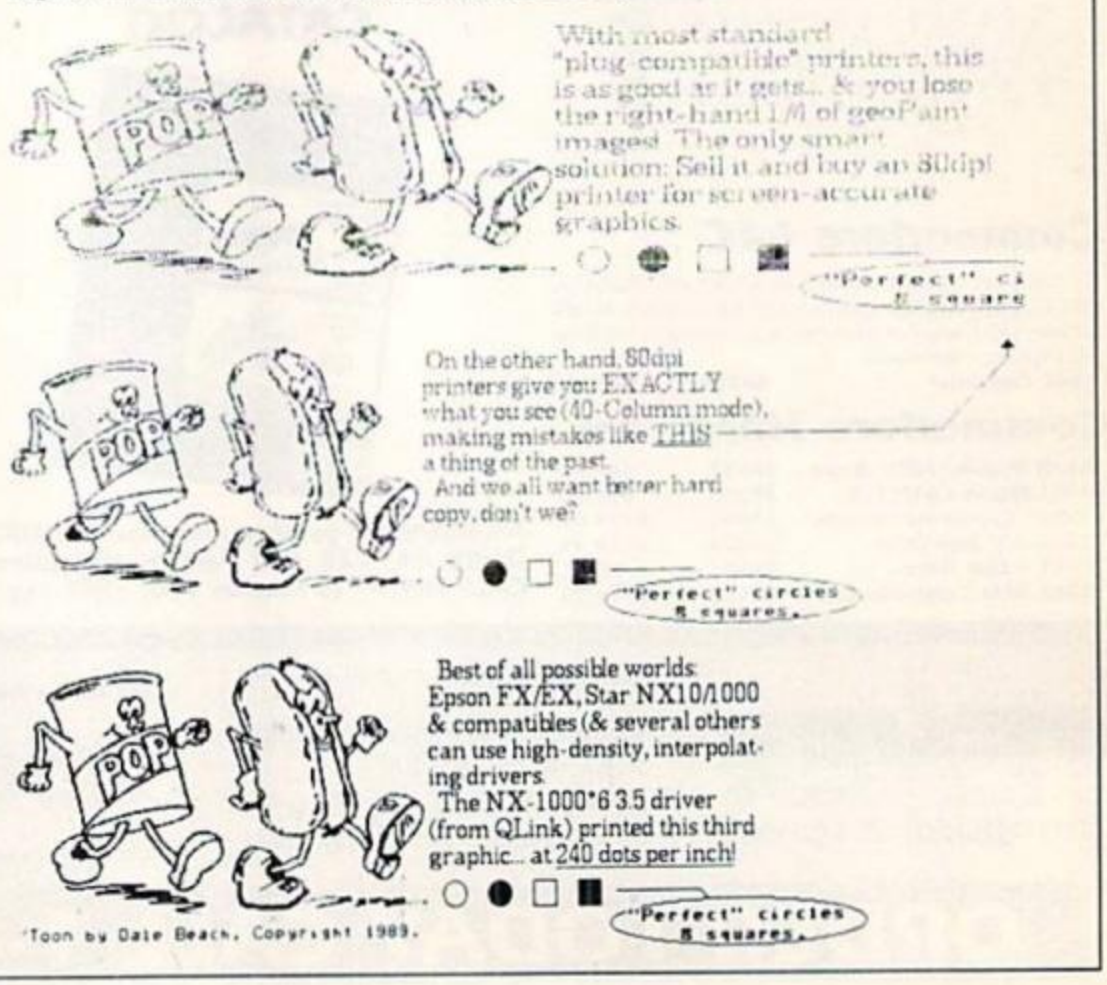
GEORAM 512 isn't meant to replace your REU, unless you want to move up to 512K from Commodore's 256K 1764. Rather, it's more of an option for those who waited too long to buy Commodore's unit.

Slightly longer than an REU, GEORAM 512 is a slim, one-half-megabyte RAM card that easily fits into cartridge ports. GEORAM's greatest strength is that it not only drives GEOS on the 128, but also on the 64 without your needing to add a heavy-duty power supply.

Because of internal differences between GEORAM and the REU, BSW's cartridge will not run non-GEOS programs that access Commodore's RAM expansion. GEORAM comes with its own GEOS system disks and is not battery backed, so if you power down before saving your work to a real disk, your RAM files will become extinct. According to the folks at Berkeley, they do not now plan to add battery or ac backup power to GEORAM.

After a month of using GEORAM 512, I found that it mimics Commodore's REU in every aspect except one: It lacks the DMA (move data) feature that's built into Commodore's REU. The result is barely noticeable, however. ►

Figure 1. Examples of what different printers can produce.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Scrolling around a GEORAM-resident geoPaint page is *slightly* slower than doing the same with an REU, but both are far faster than scrolling from physical drives. When you consider that GEORAM 512 retails for less than the 1764 sold at a discount, and that it needs no hefty add-on power, the DMA loss is a small price to pay for a dramatic speed increase.

Time Waits for No One

GEOS 128 2.0 lets users open files directly from all View displays. Those who faithfully input time and date can easily use the Date option to find the latest update of a file.

For me, the deskTop View by Date option is often a waste of time, for I usually forget to set GEOS's software clock before beginning a session. So, much of my work sports the time and date of the current deskTop plus an hour or so—hardly an efficient way to track back-up files! After wasting many hours in file searches, I longed for a battery-backed clock.

The Right Time cartridge from Ardelt Engineering forever puts to rest opening Preference Manager or using GEOS 2.0's Time box. Unlike early kits that swallowed joystick port two or involved rewiring the computer itself, this cartridge merely plugs into the user port, and it has an in-line, flow-through design that doesn't interfere with RS-232 printer or modem operations.

In addition, with a little programming knowledge (examples and routines are included on a disk), The Right Time can be used with non-GEOS software and with both Basic and machine language programs.

Although initial setting of the time and date is complex, once you've done so and placed Autotime (an auto-execute GEOS file for 1.3 and higher versions) on your system disk, you need never set the time again, and View by Date truly becomes a valuable menu selection. The user-replaceable battery should last two years, or longer if you're a daily computer user.

Today, Tomorrow and Beyond

Creative Micro Designs produces hardware that geoUsers will love. A ROM replacement kit called JiffyDOS (the latest version is 6.0) speeds up 1571/81 disk operations with GEOS 128 (GEOS 64's Disk Turbo software is quite fast, so it bypasses JiffyDOS ROMs).

Would you like to keep your GEOS RAM disk data alive after shutting off your computer? CMD's RAMLink, with its separate power supply, will let you do just that. Scheduled for release soon, RAMLink's internal operating system also lets most Commodore software read a 17XX REU as a high-speed disk drive, much as GEOS does. In addition, RAMLink will access up to one megabyte of RAM storage.

For mass storage with GEOS, we presently have only the 1581 drive. Also scheduled to appear soon are CMD's GEOS-ready, reasonably priced 20- and 40-megabyte hard drives—this should finally put mass storage in the hands of Commodore owners. ■

Don Eamon is a full-time freelance writer and computer consultant who has run GEOS SIGs on several BBSs.

Table 1. Prices and Manufacturers' addresses.

GEORAM 512
$124.95
Berkeley Softworks
2150 Shattuck Ave.
Berkeley, CA 94704

JiffyDOS 6.0
C-64/$59.95; C-128/$69.95
RAMLink
price unavailable at press time
HD-20; HD-40
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Creative Micro Designs
PO Box 789
Wilbraham, MA 01095

The Right Time
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DB9	Y cable				1F 2M	JSY	$4.95
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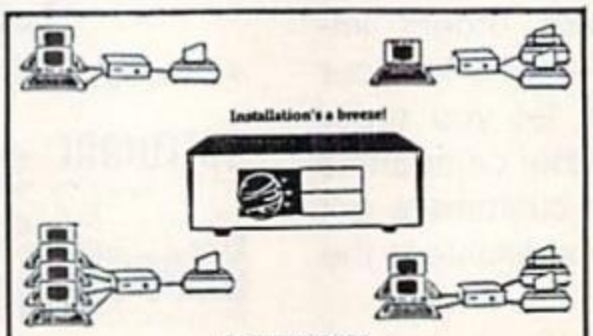

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COMMODORE CLINIC

Advice about head alignment problems, disk errors and ROM upgrades.

By ELLEN RULE

Q *My C-128 has an annoying glitch. It occurs most often after I've been using C-64 mode. This message appears, and I can't load PaperClip III or Partner 128:*

```
   PC  SR AC XR YR SP
; 82042 31 75 27 80 F2
```

What does this mean?

—M. SIEGEL
GREAT NECK, NY

A The cryptic message is from the 128's built-in machine language (ML) monitor, a programming and debugging tool for ML programmers. The characters in the top row represent the following: PC: Program Counter; SR: Status Register; AC: Accumulator; XR and YR: X and Y Registers; and SP: Stack Pointer. The numbers below are the memory address and the hexadecimal values that describe the state of the processes taking place as the machine language program runs.

Normally, to get to the machine language monitor from Basic 7.0, press the F8 key (shifted F7), or type in MONITOR. If you accidentally find yourself in Monitor mode, pressing the X key and return brings you back to Basic 7.0. (For those interested in knowing more about machine language, Jim Butterfield's book *Machine Language for the Commodore 64, 128 and Other Commodore Computers* is an excellent source of information.)

On start-up, the C-128 performs several tasks before presenting the Ready prompt. Arriving in the monitor on reboot indicates that this start-up sequence has been disrupted, possibly because of a problem in your Partner 128 cartridge. Try running your 128 with the cartridge disconnected to see if the symptoms continue. Also try shutting off the computer and waiting a minute before rebooting to allow all of the C-128's memory to reset. If neither method helps, consult a Commodore-authorized repair person.

Q *My 1571's been giving me problems when writing to the second side of a disk. What do you think is the problem? If it's alignment, what's the best way to fix it?*

—R. WRIGHT
BRONX, NY

A It's not uncommon for the second drive head (the one that gives your 1571 its double-sided capacity) to be slightly crooked, in which case you should consult a technician. Alignment problems aside, disk errors can also be related to your operating mode or the ROM version of your drive.

If a disk is formatted in 1541 mode, only one side is formatted, so trying to write to the other (unformatted) side won't work. For double-sided format, lock the drive in 1571 mode before formatting by typing in OPEN 15,8,15, "U0>M1":CLOSE15.

Another problem stems from trying to validate a 1571-formatted disk in a 1541 drive (or while in 1541 mode on early 1571s), since track numbers greater than 35 are inaccessible to the 1541 Disk Operating System (DOS). If the validation doesn't abort, the procedure might write a zero to (in other words, turn off) the double-sided flag in the disk's block allocation map. Thus, a disk formatted as double-sided may no longer be perceived as such by the drive.

The 1571 ROM revision (310654-05) in the spring of 1987 included corrections to this 1541-mode validation problem, as well as some seemingly random problems affecting relative files. If your problem seems to be with relative (REL) files on the second side of the disk, a Commodore repair technician should be consulted regarding upgrading your drive's ROM chip.

Q *Is there a program available that aligns the 1571 mode of my 1571 disk drive, without affecting the 1541 mode?*

—ETHEL DRAGON
PORTLAND, NY

A No. The drive head used in 1541 mode is part of the same mechanism used in 1571 mode. Since head alignment affects how far the head unit advances and retreats, and since the heads move as one unit, there's no standard alignment procedure for 1571 mode that won't affect the placement of the head in 1541 mode.

Q *We've just added an Amiga to our flock of 64s and 128s. Is it possible for the Amiga and a 128 to share the use of our Star NX-10 printer?*

—BUTCH HERBERT
SANBORNVILLE, NH

A Yes, computers can share peripherals via an A-B switchbox. For your situation, a parallel A-B switchbox will accept the parallel connector from both the Amiga's printer cable and the C-128's parallel interface. A parallel-to-parallel cable will connect the box to your NX-10. I've also used parallel A-B switches to connect two printers to one computer so that I could, for example, use paper in one printer and labels in another.

Switchboxes can generally be used to control devices that share a common mode of interface. My Amiga shares a 1541 drive with my C-64 via the 64 Emulator cable from ReadySoft (PO Box 1222, Lewiston, NY 14092) and a 5-pin DIN A-B switchbox. I've also set up the sharing of a Hayes-compatible modem by connecting a serial switchbox to both the Amiga's serial port and an RS-232-interfaced C-64. ABCD switchboxes allow 4-to-1 interfacing, if more than two peripherals are involved. One source of switchboxes, including the 5-pin DIN A-B model, is VSI (3641 SW Evelyn, Portland, OR 97219; phone 1-800-544-7638).

For safety's sake, don't change the switch while the attached peripherals are "live"; the small amount of power that may be present can damage your components. Also, communications mix-ups may occur if you switch components mid-stream, since computers often send "handshake" signals and initialization sequences to their peripherals on boot-up. Switching components could cause ►

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the unrecognized component to behave in unexpected ways.

Q *What do you add to a program to avoid getting the Basic screen when you press run-stop/restore?*

—JOE POSILLICO
SOUTH FARMINGDALE, NY

A In C-64 mode, enter POKE 808, 239 to disable the run-stop key; disable the restore key with POKE 792,193. Enable run-stop with POKE 808,237 and restore with POKE 792,71.

In C-128 mode, POKE 808,100 disables run-stop and POKE 792,125 disables restore. Enable run-stop with POKE 808,110 and restore with POKE 792,64.

Q *Some time back I bought new ROMs for my C-128 and 1571 to take care of problems such as the 1571 having trouble reading the second side of a disk and the infamous Save-with-Replace bug. I'd been using the @Save command until I noticed an update in Commodore Clinic* (RUN, *October 1986), which stated that the bug is still with us! Did I pay $35 for nothing? Is the bug still there or not?*

—HAROLD BENTLEY
HILLSBORO, MO

A The Save-with-Replace bug, the operating code error that supposedly causes disks to become hopelessly scrambled, was addressed again in revision 05 of the 1571 ROM chip, released in 1987. Commodore's Fred Bowen, who was instrumental in upgrading the ROMs, says that while there's still plenty of conjecture about the Save-with-Replace bug, it hasn't been shown to exist since version 04 (not publicly released). Regardless of this bug, it's important to realize that the ROM revision solved many problems that may not be obvious, resulting in a significant improvement in the overall operation of the machine.

With the addition of the 128 ROM upgrade chip set, you're benefitting from improved handling of several functions, such as the operation of RAM expansion and RAM DOS. By the way, C-128D owners (US version) don't have to worry about the ROM upgrade, since the 128D uses a different ROM chip.

If you're skittish about the Save-with-Replace bug, start with a freshly formatted work disk before typing in a listing. As you go along, save versions of the program appended with the line number you've just entered, for example: MYPROGRAM350, MYPROGRAM500, etc. When you've got a finished version of the program, copy it to another disk and reformat the work disk for other uses. This method of "incremental saves" reduces the extent of loss should one of the saves become corrupted. ■

Do you have a problem or question about your Commodore computer system, software or programming? Just send your questions to Commodore Clinic, RUN Magazine, 80 Elm St., Peterborough, NH 03458. Queries are answered only through this column, and, due to the volume of mail, only questions likely to appeal to the majority of our readers can be published.

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Item: Due to an editorial oversight, an error cropped up in John Ryan's article, "Online, In Touch, Out of Sight," in the February 1990 issue. In Table 4 on page 31, the city, state and ZIP codes of GEnie and American PeopleLink were interchanged (although the street addresses and phone numbers were correct). The correct addresses of both online services are as follows:

GEnie
General Electric Information Service
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GEORAM REVIEW—
Among the products reviewed next month will be Berkeley Softworks' GEORAM expansion card. If you're a GEOS user, you'll want to find out if you need this plug-in cartridge for additional memory and added performance.

RERUN PREVIEW—
Here's the lineup for the March–April 1990 ReRUN disk: **Colorout**—Knock down the colored wall with your C-64; **Speedy Viewer**—Check the contents of your C-64 disks; **Print a Month!**—Get organized with monthly calendar printouts. C-64; **Color Me Quick**—Make C-64 screen-color changes; **128 Basic Enhancer**—Four commands to edit or write programs; **Doing the Alphabet Shuffle**—Put this letter puzzle in order on your C-64; **Alien Strike**—Protect Earth from space attackers. C-64; **Basic Dater**—Identify the latest version of your C-64 or 128 program listings; **Connex**—A Tetris-type game for the C-128; **128 Mode**—Discover the secrets of the Directory command. Plus Bonus programs: **Grand Prix Challenge**—Auto racing on the 64; and **Snake Bite**—Snakes are loose in the lab! C-128.

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The illustration on p. 36, in the March issue, was done by David Garner. We apologize for the error.

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RUN's Checksum & Program Typing Hints

TYPE IN *RUN*'S CHECKSUM, which serves for both the C-64 and for the C-128 in either 40- or 80-Column mode, and save it to disk before running it. When typing in a program from *RUN*, first load and run *RUN*'s latest version of the Checksum program, which contains a new feature explained below. The screen will display a SYS number (49152 for the C-64; 3328 for the C-128) that deactivates and reactivates the Checksum. Always disable *RUN*'s Checksum before attempting to run another program. Note: You can abbreviate Basic keywords; spaces affect the checksum only when within quotes; and the order of characters affects the checksum.

When you press return after typing in a program line, a one-, two-, or three-digit number from 0 to 255 appears in the home position. If this number matches the checksum value in the program listing, the line as you typed it is correct. If the number that appears doesn't match the checksum value, compare the line with the magazine listing to find your error. Then move the cursor back up to the line and make your corrections. Now, after you press return, the correct checksum value should appear. Continue entering the listing until all the lines have been correctly typed. Then deactivate *RUN*'s Checksum, using the appropriate SYS number, and save the finished program.

We sometimes get letters and phone calls from new readers who have typed in the Checksum program for the first time. They are confused by the "Out of Data Error in Line 30" message that appears when they try to run the Checksum program. Understandably, they compare line 30 of the listing with line 30 as they typed it in, and cannot find anything wrong. The message unintentionally misleads them into thinking the error is in line 30, whereas the typing mistake is actually somewhere in one of the Data statements in lines 190–350.

So, we've added a new feature to the Checksum program that alerts readers to the number of the Data statement line in the Checksum program where an error has actually been made. **Note that this feature works *only* on the Checksum program itself, and not on any other program listing in *RUN*.**

After you've entered and saved the Checksum program to disk, run it. If you've made any errors in any of the Data statements, the program will give you a specific line number. Find the mistake, correct it, press return, save the program and run it again. Repeat this procedure until the Checksum program runs flawlessly.

Control Characters Demystified

All the graphics and control characters in the listings in *RUN* have been translated into understandable key combinations. They are the instructions you see inside the curly braces. For example, {SHIFT L} means you hold down the shift key while you press the L key once. You do *not* type in the curly braces. What appears on the screen will look quite different from what is designated inside the braces. Here are some more examples:

{22 SPACES}—press the space bar 22 times.

{SHIFT CLR}—hold down the shift key and press the clr-home key once.

{2 CRSR DNs}—press the cursor-down key twice.

{CTRL 1}—hold down the control key and press the 1 key.

{COMD T}—hold down the Commodore logo key and press the T key.

{5 LB.s}—press the British pound key (£, *not* #) five times.

Refer to the following paragraphs for any other Error messages you get from running any program listing in *RUN*.

Other Error Messages

Having heard from many users over the years about their difficulties with typing in listings, we've identified a few recurring problems that plague many people but are easy to fix. So read on and see if your problem is one of these.

- You get an "Out of Data in Line xxx" message. This means that a program line was reading from Data statements and reached the end of the data before it was done reading. There are two possible problems.

One might be with the program line that reads the data, usually a For-Next loop. Make sure you have the proper values for the loop, because if, for example, the listing has a loop of 0 to 150, and you've typed 0 to 160, you'll get the Out of Data message. If the loop is correct, then the problem lies in the Data statements themselves. One possibility is that you omitted a whole line of data. That's easy enough to find and correct. It's more likely that you've skipped one or more individual data items or typed in a period instead of a comma, which causes two data values to be read as one number. Check your typing carefully against the listing. Using *RUN*'s Checksum program when you type in listings from the magazine should help in this case.

- You get an "Illegal Quantity Error in Line xxx" message. This means you've read a number from a Data statement and tried to poke it into a memory address. The error occurs because the number is larger than 255 (the largest value a memory address can contain), which means that somewhere in your Data statements you've made an error by typing in a number larger than 255. Again, this is easy to check for and correct. First look in your Data statements for a number larger than 255. You might have added an extra digit, or perhaps you ran two numbers together (23456 instead of 234,56).
- You get a "Syntax Error in Line xxx" message. This could be almost anything. What it tells you is that there is something wrong in the indicated line. Usually you've misspelled a Basic keyword or omitted some required character. List the line and examine it carefully.
- You get an "Error in Data" message. This occurs in programs that add up all the data as read, and, when finished, compares that sum with what it should be if the data were typed in correctly. If it isn't the same, it means an error somewhere in typing the Data statements. Go back and check the data carefully. Correct the mistake(s), save the new version and try again.
- Finally, we urge everyone who intends to type in one of our listings to use *RUN*'s Checksum program, which will help you avoid every mistake we've mentioned above, except that it won't detect the omission of a line. R

Listing. *RUN*'s Checksum program. This program is available on *RUN*'s BBS for users to download.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK
20 MO=128:SA=3328:IF PEEK(4096)THEN MO=64:SA=49152
30 I=0:CK=0:CH=0:LN=190
40 FOR K=0 TO 16
50 FOR J=1 TO 10:READ B:IF B>255 THEN GOTO 170
60 CH=CH+B:POKE SA+I,B:I=I+1:NEXT
70 READ LC
80 IF LC<>CH THEN GOTO 170
90 CH=0:LN=LN+10
100 NEXT K
110 POKESA+110,240:POKESA+111,38:POKESA+140,234
120 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
130 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128 THEN 1
    60
140 POKESA+13,124:POKESA+15,165:POKESA+25,124:POKESA+2
    6,165
150 POKESA+39,20:POKESA+41,21:POKESA+123,205:POKESA+12
    4,189
160 POKESA+4,INT(SA/256):SYS SA:NEW
170 PRINT"YOU HAVE A DATA ERROR IN LINE ";LN;"!":END
180 REM DO NOT CHANGE THESE DATA STATEMENTS!
190 DATA 120,162,24,160,13,173,4,3,201,24,884
200 DATA 208,4,162,13,160,67,142,4,3,140,903
210 DATA 5,3,88,96,32,13,67,152,72,169,697
220 DATA 0,141,0,255,133,176,133,180,166,22,1206
230 DATA 164,23,134,167,132,168,170,189,0,2,1149
240 DATA 240,58,201,48,144,7,201,58,176,3,1136
250 DATA 232,208,240,189,0,2,240,42,201,32,1386
260 DATA 208,4,164,180,240,31,201,34,208,6,1276
270 DATA 165,180,73,1,133,180,230,176,164,176,1478
280 DATA 165,167,24,125,0,2,133,167,165,168,1116
290 DATA 105,0,133,168,136,208,239,232,208,209,1638
300 DATA 169,42,32,210,255,165,167,69,168,170,1447
310 DATA 169,0,32,50,142,169,32,32,210,255,1091
320 DATA 32,210,255,169,13,32,210,255,104,168,1448
330 DATA 96,104,170,24,32,240,255,104,168,96,1289
340 DATA 56,32,240,255,138,72,152,72,24,162,1203
350 DATA 0,160,0,32,240,255,169,42,208,198,1304
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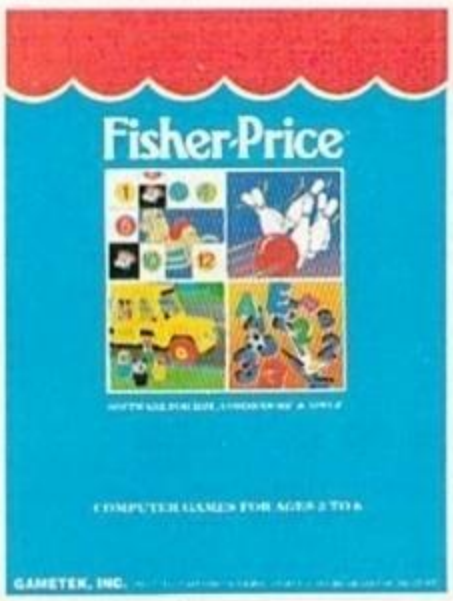
RUNNING RUMINATIONS

From page 4.

THE BRITISH GOSSIP-MONGER *CTW (Computer Trade Weekly)* has ripped asunder the veil of secrecy surrounding Commodore's new Amiga 500-based CD-ROM system. In its January 23 issue *CTW* reported that, according to reliable sources, Commodore privately showcased a CD-ROM games console at CES. A public showing, according to the article, probably won't occur until the summer CES. *CTW*'s sources remain unnamed, in view of the "ultra stringent non-disclosure agreements" viewers had to sign. Now, *RUN*, one of many "important publishers" at the show, will neither confirm nor deny whether its editors got in to view the new machine and had to sign the non-disclosure statement. . .at least not until the ink dries.

FROM THE FRYING PAN INTO THE FLOPPY. That's what Eastman Kodak has done with its latest disks. The Verbatim disks are Teflon-coated and claim to safeguard your valuable data from fingerprints, spills or other smudges, which can simply be wiped off the surface. A Kodak spokesperson, who appears to be having a lot of fun with this promotion, is quoted as saying, "The only thing that sticks to our diskette is people's data."

EPYX IS BACK IN THE SOFTWARE BUSINESS, FOLKS! After a slight detour that included a management reorganization and laying off a large portion of its work force, Epyx is determined to return to its rightful place in the video and computer game industry. The ten-year-old company plans to continue to develop and market new games under the Epyx label. Also, the company, according to VP of Marketing and Product Development, Bob Botch, has repackaged some of its previously released software and tied it together with an attractive price tag. Epyx, one of the early developers of game software for home computers, is probably best known for its Games series of sports software.



DON'T READ THIS IF YOU'RE A CHILD PSYCHOLOGIST! No one will be left untouched by the pervasive computer phenomenon—not even three-year-olds. Fisher-Price, that most revered name in toys for young children, has created C-64 computer games for kids aged three to eight. The games are designed to help children learn and reinforce their skills in counting, memory, coordination, etc. The games may be OK, but we have to ask: Is playing games on a computer an appropriate way for a three-year old to be spending his or her time, and should we be encouraging it?

JUST WHEN YOU THOUGHT IT WAS SAFE. . . Like many of our readers, I'm concerned about our environment. I'll admit to a certain amount of smugness, since I always considered computer publishing a so-called "clean" industry. So, it came as a shock when I learned that IBM has been cited in a report entitled "Who's Who of American Ozone Depleters." The Natural Resources Defense Council listed companies dumping chlorofluorocarbon-like substances, which, some scientists claim, are depleting the Earth's ozone layer. For its part, IBM uses these chemicals to clean and degrease electronic components and metal equipment. We fervently hope that IBM—still reeling from a disastrous fiscal quarter—and other companies will stop using ozone-depleting products and find suitable substitutes.

MOM KNOWS BEST. . . Following in the high-heeled footsteps of Heloise, Dear Abby and Ann Landers, Charlyne Robinson, better known as Konami Mom, is traveling around the country answering questions and offering advice to families on how best to integrate video games into the home setting. Sponsored by Konami, Mom helps families adjust to the inevitable video game playing and offers—not game-playing tips—but advice such as how to balance game playing with homework. "Our children have become so accustomed to electronics and electronic learning that some kids find traditional learning and entertainment conventional and boring. Just as our parents had to adjust to raising kids with television, we have to adjust to video games," says the mother of two boys who are avid video game players.

Dennis Brisson

Dennis Brisson
Editor-in-Chief

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ATTENTION GEOS USERS: THE WAIT IS OVER.

For everyone who's ever waited a tad too long for a GEOS screen to redraw itself or an application to load, congratulations. The wait is over. Your chips have come in.

The GEORAM expansion board—for both 64's and 128's—is here.

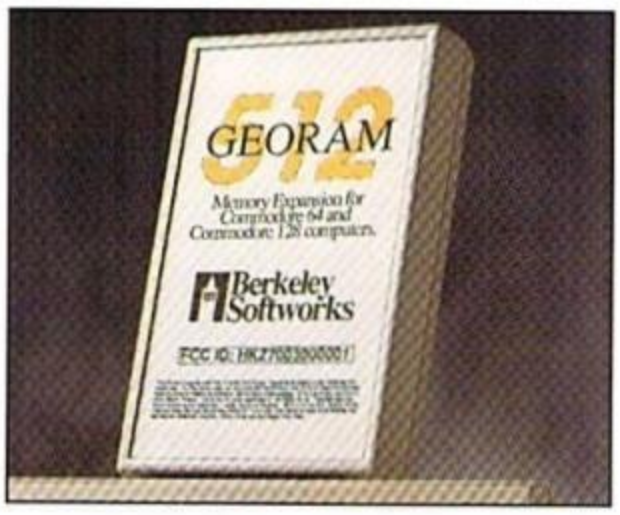
MORE MEMORY, LESS WAITING.

Developed exclusively for GEOS-equipped Commodores, these babies pack an unbelievable 512K of extra memory, which propels GEOS into light speed productivity. Accessories pop up in an instant. Screens redraw in a wink. And applications scream out in a frenzy as you whip them along with your mouse or joystick.

"An additional 512K of memory... is a really impressive upgrade... The usefulness of this becomes evident when using GEOS, as it can practically eliminate the... disk access you normally encounter." —*Run* Magazine

Hard to believe? Believe it. GEORAM's disk transfer rate is literally 35 times faster than the 1541, 1571 or 1581 disk drive. Which has the industry chattering almost as much as when GEOS first arrived on the scene:

"The difference between operating... on a 640K machine instead of a 128K machine could be compared to flying a jet and walking. Tasks that would normally cause a delay while the



disk was accessed run at the speed of light..." —*Commodore* Magazine

Pretty heady stuff. But every word of it's true. Because GEORAM stores everything electronically. Which means your Commodore doesn't waste time spinning magnetic disks searching for data.

That not only increases your machine's performance. It also increases yours. Because the time you used to spend waiting is being put to better use drawing, writing or doing any of the thousands of things you're using GEOS for.

"RAM expanded C-series machines... running under the GEOS kernel—are nearly as fast and flexible as the powerhouse Mac's, ST's, Amigas and PC's." —*Computer Shopper*

So if you'd like to delete the delay, call us toll free at 1-800-888-0848 and order your GEORAM card today. You'll discover the difference in no time.

"It's the same GEOS, but unless you experience RAM expansion, you can't imagine the transformation... Some operations run a few seconds quicker, others (such as deskTop utilities) seem to appear before you select them... My RAM expander is the most cost-effective purchase I've ever made. Try one, and you'll never go back to magnetic media." —*Computer Shopper*

The GEORAM Expansion Card. It may have been a long time coming, but it's definitely been worth the wait.

Not available in retail stores!
No external power supply needed!

*On top of the disk turbo speed you already get with GEOS. Mail orders: Send name, address, city, state, zip and phone number along with check or money order for $124.95 plus $4.95 for postage and handling, made payable to Berkeley Softworks (Do not send cash) to: Berkeley Softworks Fulfillment Center, 5334 Sterling Center Drive, Dept. G9, Westlake Village, CA 91361. Allow two to four weeks for delivery.

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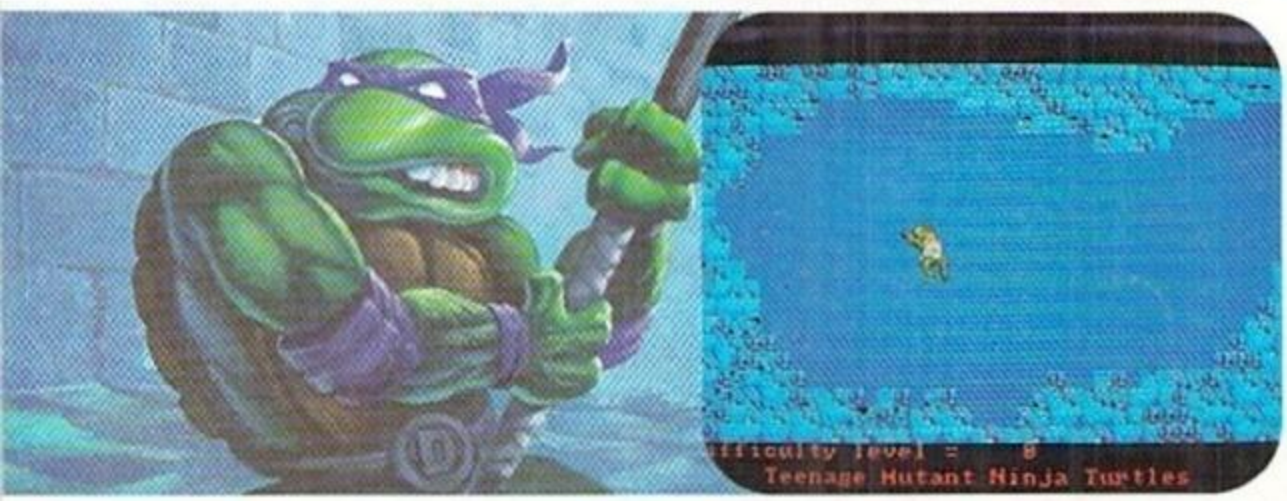
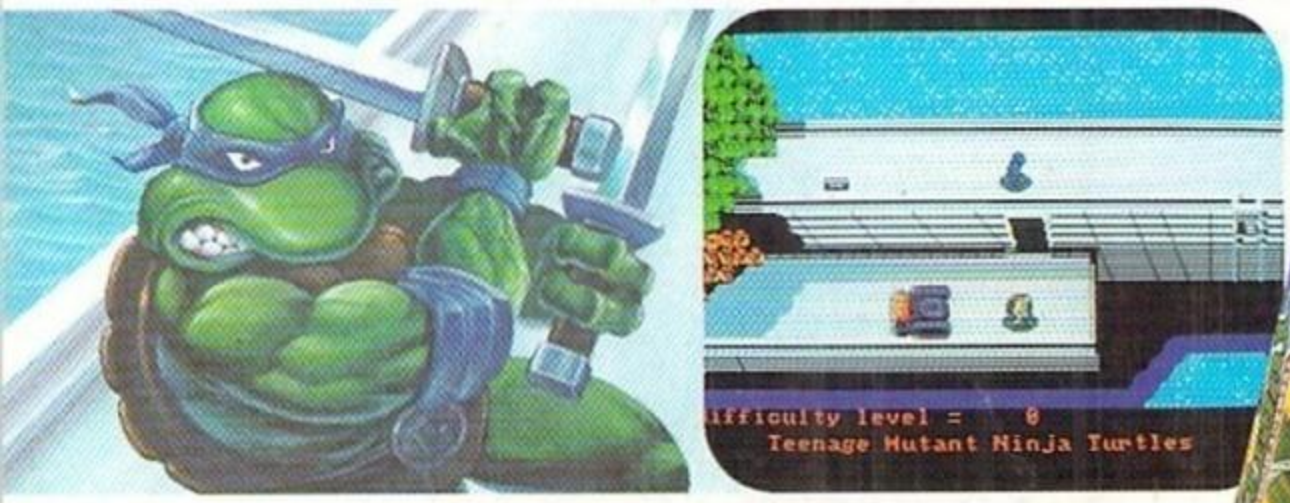
FOUR COMPUTER HACKERS ARE ABOUT TO RAID YOUR DISK DRIVE.





No computer will go unscathed, as Ultra's version of Teenage Mutant Ninja Turtles® storms into your disk drive to duke it out with Shredder™—a maniac more menacing than an army of mind-altered Bruce Lees.

But if they're to survive, you must command the role of each turtle, rumbling through a maze of Mouser™ infested sewers, criminally polluted rivers and alleys patrolled by the fanatical Foot Clan.™

Along the way, search for bonus weapons like the Triple Shuriken. You'll have to also think fast, switching turtle identities in order to match their karate skills with those of the enemy.

So grab your joystick and nunchukus, then control every leap, chop, slice and dice, until you splatter Shredder senseless or get yourself hacked into turtle soup.

Now featuring the ULTRA® "GAME SAVE" command.

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Teenage Mutant Ninja Turtles is available for IBM, Commodore and Amiga.

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